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THE AILING DEFENSE INDUSTRIAL

BASE: UNREADY FOR CRISIS

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96th Congress }
2d Session }

COMMITTEE PRINT

{ No. 29

**THE AILING DEFENSE INDUSTRIAL
BASE: UNREADY FOR CRISIS**

R E P O R T

OF THE

DEFENSE INDUSTRIAL BASE PANEL

OF THE

COMMITTEE ON ARMED SERVICES

HOUSE OF REPRESENTATIVES

NINETY-SIXTH CONGRESS

SECOND SESSION

DECEMBER 31, 1980



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COMMITTEE ON ARMED SERVICES

NINETY-SIXTH CONGRESS, SECOND SESSION

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LETTER OF TRANSMITTAL

DECEMBER 29, 1980.

HON. MELVIN PRICE,
*Chairman, Committee on Armed Services,
House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: I am forwarding to you a copy of the final report of the Defense Industrial Base Panel entitled "The Ailing Defense Industrial Base: Unready for Crisis." In preparing the report, the panel held 13 days of hearings, including 4 days of field hearings, and took testimony from 34 witnesses.

The panel finds that there has been a serious decline in the nation's defense industrial capability that places our national security in jeopardy. An alarming erosion of crucial industrial elements, coupled with a mushrooming dependence on foreign sources for critical materials, is endangering our defense posture at its very foundation.

It has been my privilege to chair this examination of one of the nation's most important national resources, our defense industrial capability. On behalf of the panel, I want to acknowledge and thank our staff (Tom Cooper, Don Campbell, Adam Klein, Dave Price, Tony Battista and Mary Ann Gilleece) for their excellent assistance in this study.

I shall appreciate your early approval of the report so that it may be printed.

With kindest personal regards,

Sincerely,

RICHARD H. ICHORD,
Chairman, Defense Industrial Base Panel.

Approved for printing:

MELVIN PRICE, *Chairman.*
December 30, 1980.

(III)

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FINDINGS AND RECOMMENDATIONS

MAJOR FINDINGS

The panel finds that:

- the general condition of the defense industrial base has deteriorated and is in danger of further deterioration in the coming years;
- the Department of Defense has neither an on-going program nor an adequate plan to address the defense industrial base preparedness issue; Department of Defense inaction in enhancing industrial base preparedness, coupled with instability within the five year defense program, weapon system procurement stretchouts, inadequate budgeting and inflation, has contributed to the deterioration of the U.S. defense industrial base, and as a consequence, jeopardizes the national security;
- a shortage of critical materials, combined with a resulting dependence on uncertain foreign sources for these materials, is endangering the very foundation of our defense capabilities. These shortages are a monumental challenge to the Congress, the Department of Defense, the defense industry and the civilian economy;
- present policies and procedures for the procurement of property and services by the Department of Defense are excessively inflexible and discourage the use of contract types that would promote the best interests of the United States; as a result, many procurement contracts cannot be written that would promote stability, encourage capital formation and lead to efficiencies that would result in savings to the government;
- current tax and profit policies appear to discourage capital investment in new technology, facilities and equipment that would increase productivity and improve the condition of the defense industrial base; and
- while the condition of the defense industrial base is of vital importance to the national defense and security of the United States, responsibility for the condition of the base is dispersed among the committees for the Congress and within the executive branch; this diffusion of responsibility has contributed to a lack of effective long range planning for industrial responsiveness and has made it extremely difficult to assess the overall effects of executive and congressional action on the defense industrial base.

RECOMMENDATIONS

LEGISLATIVE RECOMMENDATIONS

The panel recommends that the Committee on Armed Services, early in the 97th Congress, favorably consider legislation to:

(1)

- repeal section 810 of the Act of October 7, 1975, Public Law 94-106 (89 Stat. 539) thereby removing the existing \$5 million ceiling on cancellation costs applicable to multiyear defense procurement contracts;
- require that the Committees on Armed Services and the Committees on Appropriations of the Senate and House of Representatives be notified in advance of the award of any multiyear contract which contains a clause setting forth a cancellation ceiling in excess of \$50 million;
- establish a policy for defense procurement that will promote flexibility and permit the use of contract types, including multiyear contract types, that will result in the acquisition of weapon systems and other items in the most timely, economic and efficient manner; and provide that contracting, where practicable, should provide incentives to defense contractors to make economic purchases of material and to improve productivity by investment in technology, capital facilities and equipment;
- specifically authorize multiyear contracting, including contracts for weapon systems; establish guidelines for multiyear contracting; provide that cancellation clauses may reflect recurring and nonrecurring costs; and provide that the costs of cancellation or termination may be paid from appropriations originally available for the performance of the contract concerned, from appropriations not otherwise obligated, or from funds appropriated for those payments;
- provide that advance procurement of components, parts, and materials necessary to manufacture weapon systems may be for a term of not more than five years and that advance procurement may be used to effect economic lot purchases and efficient production rates;
- direct that future authorization and appropriation requests for the acquisition of weapon systems, or portions thereof, indicate the most efficient production and acquisition rate for each system;
- amend section 2306 of title 10, United States Code, by striking out the geographical restriction, thereby permitting multiyear contracts for periods of not more than five years for certain services, and items of supply related to such services, within the 48 contiguous States and the District of Columbia, for which funds would otherwise be available for obligation only within the fiscal year for which appropriated;
- direct the Director, Office of Management and Budget and the Secretary of Defense to issue regulations to implement these legislative changes within 90 days after the enactment of the legislation.

NONLEGISLATIVE RECOMMENDATIONS

- That the Committee on Armed Services take the following actions:
- recommend to the President that he establish within the Executive Office of the President a point of authority to initiate *action*, and to direct and coordinate the efforts of the several responsible departments and agencies, necessary to solve the many problems

relating to productivity, quality, manpower and critical materials that afflict the defense industrial base;

- forward to the Secretary of Defense a copy of this report for review and written comment;
- request that the Secretary of Defense address, during the fiscal year 1982 defense posture hearings, the findings and recommendations contained in this report and the recommendations of the Defense Science Board Task Force on Industrial Responsiveness, 1980;
- in connection with the fiscal year 1982 budget submission, request the Secretaries of the Army, Navy and Air Force to identify those programs that would result in major cost savings, and enhance program stability, economy and efficiency if the principles of multiyear contracting, expanded advance procurement, and termination liability funding were to be applied;
- assure that the appropriate subcommittees of the Committee on Armed Services follow through on the recommendations contained in this report concerning defense acquisition policy;
- work with other congressional committees in taking action to solve the many problems afflicting the defense industrial base;
- direct attention to those problems that the panel did not address in detail during its review of the capability of the defense industrial base such as manpower-shortages, profit policy and the management and investment practices of defense contractors.

INTRODUCTION

On September 17, 1980, the Committee on Armed Services commenced a series of hearings on the capability of the U.S. defense industrial base¹ to produce the military equipment needed to insure the national security.

These hearings were prompted by an ever growing concern that the U.S. industrial base, in general, and the defense-oriented portion of that base, in particular, are not healthy. The committee's concern arose amid revelations that U.S. industrial productivity growth has declined significantly in relation to foreign competitors, that dependence on foreign sources for critical materials is increasing, that serious manpower shortages exist today and are projected to continue in the future, and that the cost of weapon systems is rising at an alarming rate.

The full committee held three days of intensive hearings in September. At the conclusion of these hearings, Committee Chairman Melvin Price appointed a 10-member panel, chaired by Representative Richard Ichord, to continue study of the problem and to report its findings and recommendations to the full committee prior to the end of the 96th Congress. In addition to Mr. Ichord and a member-at-large from the full committee, the panel included two members from each of the four subcommittees principally engaged in procurement-related activities; Procurement and Military Nuclear Systems, Seapower and Strategic and Critical Materials, Investigations, and Research and Development.

In carrying out its charter, the panel held 13 days of hearings, including 4 days of field hearings, and received testimony from 34 witnesses. These witnesses included representatives of: defense prime contractors and subcontractors, associations, the military, the General Accounting Office (GAO), the Department of Commerce, the Federal Emergency Management Agency (FEMA), the Department of Defense (DOD), and the Congress. A listing of the witnesses that appeared before the committee and the panel is included in the Appendix.

In addressing the preparedness of the defense industrial base, the panel focused attention on those contingencies that fall short of full wartime mobilization. In so doing, the panel concentrated on the base's ability to produce the weapon systems that are included in the current five year defense program and the base's ability to respond to accelerated production rates, including peacetime "surge" production rates.

As the investigation proceeded, a shocking picture emerged: the picture of an industrial base crippled by declining productivity growth, aging facilities and machinery, shortages in critical materials,

¹ Although a precise definition does not exist, the defense industrial base is broadly viewed as encompassing those elements of American industry that contribute to defense-related work and whose production capacity and technical expertise are required to meet national security requirements.

increasing lead times, skilled labor shortages, inflexible government contracting procedures, inadequate defense budgets and burdensome government regulations and paperwork.

Witness after witness testified before the panel that an erosion of U.S. industrial capability is occurring that, coupled with America's mushrooming dependence on foreign sources for minerals, is endangering our defense posture at its very foundations.

Gen. Alton D. Slay, Commander, Air Force Systems Command, grasped the tangle by its roots by noting:

The problems . . . are not new and have been growing for some time. Individually, each problem chips away at our industrial base. Collectively, these problems threaten the future of our industrial sector, our national economy and our defense. And the time to correct them is now.

These difficulties are national in scope, and if they are to be solved, have to be attacked on a national scale. I believe we know what has to be done to solve these problems, but the ultimate key to our success or failure is going to be the degree of commitment the Nation makes to these solutions. This commitment must exist at all levels of government, the military, business, and industry. Nothing short of an attack across a broad front will do.

Mr. O. C. Boileau, President, General Dynamics Corporation, also made the point that the problems currently plaguing the industrial base are not new. He directed the panel's attention to a Fortune magazine article that assessed the degree of industrial preparedness in the United States. The article disclosed:

No programs to organize manpower exist;
Wide-spread shortages of critical materials;
Means for industrial expansion seriously constrained;
No plan for national prioritization;
Threat of destabilizing inflation;
Lack of public understanding of the tasks ahead; and,
finally,
Uncertain national will.

While a good summary of many of the problems confronting the Nation today, the article is particularly intriguing because it was published in 1941, just 16 weeks before Pearl Harbor.

In the short time available to it, the panel has developed findings and recommendations that it hopes will assist the full committee as it continues its study of this critical issue. These findings and recommendations, together with a discussion of the evolution of the defense industrial base in America, are presented for the committee's consideration in the following sections.

BACKGROUND

Adequate preparation for war has never yet in history been made after the beginning of hostilities without unnecessary slaughter, unjustifiable expense, and national peril. It is only in the years of peace that a nation can be made ready to fight.²

WORLD WAR I

It was not until World War I that sophisticated war-fighting machinery appeared on and over battlefields. War waging prior to World War I involved men more than machines. World War I was the first occasion that America examined its ability and will to produce large quantities of war machines. However, even the first World War did not truly test the United States industrial capacity, and during the early days of the war many elements of America's forces had to be equipped with weapons produced by U.S. allies.

The United States' dependence on its allies for war material is illustrated by the fact that of the almost 4,400 artillery pieces furnished to the American Expeditionary Forces (AEF), only about 500 came from U.S. production lines; of the over 6,000 planes and 290 tanks employed by the AEF, only about 1,200 planes and 40 tanks were made in America. A major factor contributing to this dependence was the long lead times associated with the domestic production of critical war materiel. The lead time was 12 months for small arms, 18 months for ammunition, and 30 months for artillery pieces.

Congress, responding to the lessons learned from World War I, enacted the National Defense Act of 1920. This Act led to the establishment of an industrial planning organization within the Office of the Assistant Secretary of War. This organization was to plan for the acquisition of war materiel and for the mobilization of industrial resources. Subsequently, contingency plans were developed which addressed the mobilization of the industrial base to meet wartime mobilization requirements. These plans—the Industrial Mobilization Plans (IMP)—indicated those industrial plants which would be utilized in the event of a national emergency to produce war materiel. To provide for adequate lead time to accelerate industrial production, reserves of weapons, equipment, and other materiel were stockpiled. The IMP was prepared every three years between 1930 and 1939 and, as the U.S. entered World War II, the IMP proved to be an important factor in assisting the United States in expanding its industrial base to meet wartime requirements.

² Huidekoper, Frederic. "The Military Unpreparedness of the United States," 1915, p. 555.

WORLD WAR II

Despite the emphasis given to industrial preparedness during the years immediately after World War I, the defense industrial base had deteriorated by 1939. Yet, during the next two years, increasing demands by U.S. allies for American war materiel provided the United States with a slight edge as it entered the war. Further, since the possibility of direct involvement in the war had been anticipated as early as 1939, American industry was able to produce over 67,000 aircraft, about 29,000 tanks, approximately 180 combatant ships, and other support vessels within 24 months after entering the war.

During the war, the U.S. defense industrial base responded well and produced, among other items, 310,000 aircraft, 88,000 tanks, 10 battleships, 358 destroyers, 211 submarines, 27 aircraft carriers, 411,000 artillery tubes and howitzers, 12,500,000 rifles and carbines, and approximately 900,000 trucks and motorized weapons carriers. In 1944, the United States was building Liberty ships in 50 days, and during a single month, March of 1944, 9,117 military aircraft were built. Clearly, World War II demonstrated the United States vast industrial might and its capability to surge the industrial base to meet the requirements of a protracted war.

The conclusion of World War II saw the American industrial base undergo a rapid change from producing military hardware to producing consumer products. This reallocation of industrial resources answered consumer demands for commercial products deferred during the war. Moreover, the feeling that the last great conventional war had been fought and that nuclear weapons would deter any future war, also contributed to the reallocation of industrial resources.

KOREAN WAR

Between 1945-1950 over \$115 billion was invested in new plants and equipment to increase U.S. production capabilities. This investment raised the overall production capacity by 40 percent, but the vast majority of that industrial capacity was being fully utilized to produce commercial goods. Limited industrial resources were devoted to defense needs.

In 1950, prompted by the Korean conflict and the need to again reallocate industrial resources, the Congress passed the Defense Production Act of 1950. This Act, in its present form, is used:

To establish a system of priorities and allocations for materials and facilities, authorize the requisitioning thereof, provide financial assistance for expansion of productive capacity and supply, provide for price and wage stabilization, provide for the settlement of labor disputes, strengthen controls over credit, and by these measures facilitate the production of goods and services necessary for the national security, and for other purposes.

Specifically, the Act provides for the implementation of a system—the Defense Priorities System—which permits the President to accelerate the production of critical defense items by causing the manu-

facturer to place these items at the front of the production line; guaranteed loans to expedite deliveries of vital national defense systems; and direct Government loans to industry to expand plants and facilities in order to develop or produce essential materiel.

As a result of the tremendous build up of the U.S. defense industrial base during World War II, a healthy industrial base existed as the United States entered the Korean War. This warm base was capable of expanding and reallocating its productive resources to support national defense requirements and, with the exception of some munitions shortages, was able to provide most of the necessary war materiel.

VIETNAM WAR

During the Vietnam War, the U.S. industrial base responded relatively smoothly to demands for war-fighting machinery and supplies. Aircraft, tracked vehicles, and munitions were produced in large quantities. However, because the United States generally set the pace of the military buildup in Southeast Asia, and since war materiel production was essentially on a business-as-usual basis, the capability of the U.S. industrial base to accelerate or "surge" production to meet emergency requirements was largely untested.

POST-VIETNAM WAR ERA

The issue of the defense industrial base and its ability to respond to the demands of a crisis or war were brought into sharp focus during the post-Vietnam War era. The health of the defense industrial base and, indeed, the total industrial base, was being questioned. This heightening of interest led to a number of steps within the Federal Government and the military services to obtain a clearer picture of the problem and its implications.

This growing concern for the faltering health of the defense industrial base was highlighted in a report prepared by a Defense Science Board Task Force on Industrial Readiness in 1976. The Task Force concluded that " * * * the United States is presently deficient in the extent to which the defense industrial base is postured to provide materiel support to the forces in being in response to the full spectrum of potential conflict situations upon which our national security plans are based."

Further, the Task Force stated that "Our primary recommendation is that the Department of Defense initiate an immediate study and analysis of the requirements for creating a capability within the defense industrial base to 'surge' production rates with existing facilities and equipment in order to respond to 'limited' national emergency situations. This would provide a bridge between the conflict situation which is too lengthy to be supported by the War Reserve Materiel Stocks, but too short to last until defense production can be accelerated in response to a full national mobilization."

The extent of mobilization problems was perhaps most sharply demonstrated during the "Nifty-Nugget" mobilization exercise in the fall of 1979. It revealed major weaknesses in the machinery of the Federal Government for coordinating mobilization efforts. These

weaknesses existed in the areas of logistics and transportation, stocks of munitions and supplies, and in the ability of the industrial base to respond to rapidly accelerated military demands.

In the broader aspect, the industrial base problem is symptomatic of overall trends in the economy, including declining productivity, shortages of technical and skilled personnel, increasing industrial interdependency on other developed countries, and increasing dependence on unstable or potentially unstable countries providing critical raw materials.

In the narrower aspect, this industrial base problem relates specifically to problems concerning the U.S. defense industry, including problems attributed to tax policy, capital formation, inadequate defense budgets, and on-again, off-again weapon systems procurement practices.

DISCUSSION OF FINDINGS

DEFENSE INDUSTRIAL BASE IS DETERIORATING

FINDING

The panel finds that the general condition of the defense industrial base has deteriorated and is in danger of further deterioration in the coming years.

The panel specifically finds that:

- the defense industrial base is unbalanced; while excess production capacity generally exists at the prime contractor level, there are serious deficiencies at the subcontractor levels;
- the industrial base is not capable of surging production rates in a timely fashion to meet the increased demands that could be brought on by a national emergency;
- lead times for military equipment have increased significantly during the past three years;
- skilled manpower shortages exist now and are projected to continue through the decade;
- the U.S. is becoming increasingly dependent on foreign sources for critical raw materials as well as for some specialized components needed in military equipment;
- productivity growth rates for the manufacturing sector of the U.S. economy are the lowest among all free world industrialized nations; the productivity growth rate of the defense sector is lower than the overall manufacturing sector; and
- the means for capital investment in new technology, facilities and machinery have been constrained by inflation, unfavorable tax policies, and management priorities.

DISCUSSION

The panel's findings, as they relate to the overall health of the defense industrial base, are comprehensively documented in the public record compiled by the full committee and the panel. The panel would particularly draw attention to the presentation made by Mr. Robert Fuhrman, Chairman of the 1980 Defense Science Board (DSB) Task Force on Industrial Responsiveness, together with the Task Force's report. In addition, General Alton D. Slay, Commander, Air Force Systems Command, presented the panel with an extremely comprehensive report on defense industrial base issues. The Honorable Jim Santini, Chairman of the Subcommittee on Mines and Mining of the House Committee on Interior and Insular Affairs, thoroughly discussed U.S. minerals vulnerability. His subcommittee's report on this issue, titled "U.S. Minerals Vulnerability National Policy Implications," is included in the panel's record. The critical materials issue is treated in detail elsewhere in this report.

Production capacity and surge capability

The Honorable William J. Perry, Under Secretary of Defense for Research and Engineering, in addressing the capability of the defense industrial base, told the panel that the base is capable of producing all of the equipment which is included in the current five year defense program and has the capacity to expand production to accommodate significant increases in the defense budget. Dr. Perry indicated that the base could expand to produce " * * 50% more A-10's, F-15's, F-16's XM-1's, UH-60's, frigates, and destroyers than we are now building." Dr. Perry added, however, that "We do not have a surge capability; that is, if we wanted to double the production rate of F-16's, in three months or six months, there is no way we can do it. I define that as a surge capability, and we don't have it."

General Slay underscored this lack of a surge capability when he noted " * * after nearly 18 months under surge conditions, we could only expect to get an aggregate of 22 more A-10's and no additional F-15's and F-16's than already exist on the currently contracted delivery schedule. Obviously, with proper funding we could greatly increase the output of these aircraft, but we would not begin to see significantly large numbers flying for at least three years or more."

Turbulence exists within the base

Mr. Dale Church, Deputy Under Secretary for Defense Acquisition Policy, characterized the defense industrial base as "unbalanced." While the prime contractors in the base generally have sufficient or excess production capacity, Mr. Church pointed out that there are " * * very serious deficiencies at the first, second, third, and so on and so forth, tiers of subcontractors down to the vendor levels who are vendoring components into the team."

The Defense Science Board Task Force found evidence that the defense industrial base is shrinking. In one of the programs the task force examined, there was a reduction in one year of 1,500 suppliers from the 6,000 that had participated in that program during the previous year. In another program, the Task Force found that the number of bids on a given program declined by 40 percent from one year to the next.

Mr. Harry Gray, Chairman and Chief Executive Officer, United Technologies Corp., testified that "The supplier network that forms the base of our country's defense industry is shrinking at an alarming rate. Since 1967, the number of companies involved in aerospace production has declined by more than 40 percent. In 1967, there were approximately 6,000 companies in the industry. Today there are only about 3,500." Mr. Gray noted further that of those 3,500 contractors, there has been a turn-over of some 1,500 during the last two years.

A number of other witnesses testified that the defense industrial base is decreasing in size, but the panel was not presented with solid evidence that the overall defense industrial base has significantly contracted over the past several years. Nevertheless, the panel is convinced that there has been considerable turbulence within the base.

The base is almost totally owned and operated by the private sector. There are only 83 government owned facilities within a base which is made up, at any one time, of 25,000 to 30,000 prime contractors and upwards of 50,000 subcontractors. It is, therefore, extremely difficult to draw firm conclusions about the size of the base.

Lead times have increased dramatically

The panel's record clearly establishes that the turbulence within the base has resulted in serious bottlenecks and choke points that adversely affect the Defense Department's ability to procure military equipment in a timely, efficient and economical manner. This is reflected in the dramatic increases in lead times over the past three years in military programs. The panel's record is replete with references to these lead time increases. Mr. Fuhrman testified that "The lead times for essential equipment have been increasing rapidly, leading to delays in the fielding of modern systems. For example, from 1976 to 1980 the typical delivery span of aluminum forgings increased from 20 to 120 weeks. From 1977 to 1980 the delivery span for aircraft landing gears grew from 52 to 120 weeks. In just the last 2 years the delivery span for integrated circuits more than doubled, from 25 to 62 weeks."

Mr. Gray noted that "In 1978, normal lead times for one of our military jet engines was 19 months. Today the Air Force has to order that engine 41 months before delivery."

Many of the bottlenecks have resulted from the closure of forging and casting facilities and the lack of construction of new facilities. During the 1970's, literally hundreds of foundries closed as a result of environmental, health and safety laws and regulations imposed by the Federal Government.

Bottlenecks also arise from the greatly increased demand that has recently been placed on the aerospace industry by a booming commercial aircraft business. The base has not expanded to accommodate this additional demand, and an intense competition for limited production capability has developed between commercial and defense orders. Dr. Perry told the panel that it was his view that the industry had not expanded to meet the increased demand because it believes " * * * the peak demand is going to go away in a year or two."

Smaller subcontractors hit hardest

The panel's record indicates that the lower tier subcontractors in the defense industrial base are generally hit harder by the instabilities in defense programs, have greater capital formation problems and suffer more from the burdensome paperwork associated with doing business with the government than their larger counterparts in the base.

During a series of field hearings in California and Texas, the panel took testimony from representatives of a number of smaller firms currently involved in defense related work. Although the sample was too small to draw sweeping conclusions, several common themes ran throughout the testimony of these subcontractors, who ranged in size from 15 to 10,000 employees with sales between \$800,000 and \$650,000,000.

The sub-tier contractors told the panel that the main factors contributing to the failing health of their sector of the defense industrial base include excessive Government administration, on-again, off-again procurement practices, restrictive documentation and specification requirements levied by many primary contractors, critical shortages of trained manpower, and lack of sufficient "flow-down" of contracting benefits from prime contractors.

The panel found a consensus among sub-tier contractors that they would prefer to do business with the commercial sector because it is more stable. In this regard, sub-tier contractors suggested that defense business could be made more attractive if multiyear contracting were used. They indicated that the use of multiyear contracting could assist in providing reasonable risk protection against erratic procurement practices. *The sub-tier contractors warned, however, that only to the extent that the benefits attributed to multiyear contracting were allowed to "flow down" to the sub-tier level, will multiyear contracting provide the investment incentives necessary to stabilize the base.*

Most of the sub-tier contractors told the panel they charged more for defense business than they charged for comparable commercial business, but the panel was not able to determine, in general, how much more. As one sub-tier contractor stated: "* * * when bidding on government contracts, we factor in the regulatory and administrative requirements, and increase the price quite substantially." There were other witnesses who stated that the price difference for performing Government contracts ranged from 25 percent to double the price charged for comparable commercial contracts.

A common complaint heard by the panel was that the prime contractors do not routinely shield their subcontractors from the administrative burdens associated with doing business with the government. One small businessman told the panel that in many cases primes add administrative burdens of their own.

The panel finds that the sub-tier contractors are perhaps less able to withstand the hardships resulting from manpower shortages than the larger prime contractors. It is clear that the shortages of machinists and other skilled laborers are contributing factors which adversely affect the ability of the sub-tier base to respond rapidly to significant increases in defense production demands.

Further, several sub-tier contractors indicated that because of the domestic manpower shortages, they have increased their dependence on foreign sources to meet their manpower needs.

In general, the panel found that negative factors affecting the health of the base disproportionately injure smaller companies.

Critical manpower shortages

The panel found that skilled manpower shortages are prevalent throughout industry. The Defense Science Board Task Force concluded that a major contributor to the increasing lead times and costs currently afflicting the defense community is a continuing shortage of skilled labor. Mr. Fuhrman painted a less than promising picture when he stated that "* * * our study indicated the nation would be short 250,000 machinists in the next five years. We did not see any overall government programs aimed at solving this problem, and the individual company training efforts were only touching the tip of the iceberg. In spite of the recession and its attendant unemployment, there remains a shortage of the skills needed by the defense industry. The shortage leads to competition for labor and an upward pressure on costs."

Mr. Church echoed Mr. Fuhrman's concerns when he stated "The skilled manpower problem is probably one of the most difficult nuts to crack of these problems, particularly when we are trying to do it from a defense perspective."

As the panel's investigation proceeded, it emerged that manpower shortages penetrate deeply into the lower-tiers of the defense industrial base. Several of the sub-tier contractors indicated that while they have reserve equipment and capacity, their ability to surge is crippled by limited manpower.

Mr. Church told the panel "I think that we ought to be able to choose from the whole base of high school graduates, or whoever would like to be a skilled machinist, because we are falling 75 percent short of those needs to merely take care of the loss that we are seeing on an annual basis. So we should turn over every stone. Wherever we can find a person, we have got to use them."

The panel did not examine the capability of the U.S. educational system to satisfy the manpower demands of the defense industrial base, particularly in the skilled trade areas. The panel suggests that the role of the U.S. educational system and its impact on the preparedness of the defense industrial base be reviewed by the Committee on Armed Services and other appropriate House Committees and the Department of Defense.

The panel believes that the solution to this national manpower problem will require a national commitment. Further, unlike World War II, when under full mobilization, thousands-upon-thousands of people—farmers, housewives, construction laborers, clerks, and others—answered "the call to arms" and poured into our defense factories, the current economic environment and weapons system sophistication will not support any quick fix or emergency manpower reallocation to satisfy surge requirements.

Mr. Gray made this point when he stated: "Building the plant and getting the equipment are only part of the job. During the second World War, we brought in people who never before had worked in a factory—farmers, clerks, housewives. They were trained in a matter of weeks to build aircraft engines. And they built thousands of them. Today, however you can't just take someone off a farm or out of a kitchen and expect him or her to build aircraft engines. The technology is too advanced, the tolerances too tight, the equipment too sophisticated. It takes three years for a machinist apprentice to complete his rigorous course. It takes the better part of a year to retrain someone from producing autos, for example, to work on high technology aerospace parts."

The current manpower shortages have created a "sellers market" for engineers, computer professionals, and other skilled workers and competition for these scarce human resources is intense. The panel was told that "head hunters" were being paid \$1,000 or more for recruiting engineers and computer professionals for many of the firms. It is clear that in the absence of adequate supplies of engineers, computer professionals, machinists, and other skilled workers, the defense industrial base will continue to exhibit symptoms of failing health.

United States losing ground in world markets

Another symptom of the decline in vitality of the industrial base is the diminishing United States share of the total manufacturing exports of the world's industrialized nations, dropping from about 25 percent in 1960 to about 17 percent in 1979. The significance of this decline in the United States economy, relative to the remainder of the

world, is difficult to assess; but this import penetration into certain industrial sectors, such as machine tools, industrial fasteners and semiconductor devices, suggests an unacceptable dependency on foreign sources for key elements of defense production.

Semiconductor components and devices are vital elements of the defense posture of the United States. Most U.S. military hardware today incorporates integrated circuits and transistors. While the United States continues to play a leading role in the semiconductor industry, serious concerns exist about the long term ability of the United States to maintain its hold on this market.

Increasing dependence on foreign sources for critical components

Presently, United States based firms dominate the rapidly growing semiconductor marketplace, having captured about two-thirds of the \$13 billion annual world market. The Japanese, however, pose a serious challenge to United States leadership in this field. While the United States is still a net exporter of semiconductors to Japan, imports are rising faster than exports.

The Japanese made major inroads in the United States market during 1979 when American producers failed to achieve the capacity needed to meet a surge in demand. Japanese producers recently took almost half of the United States market for the most widely used integrated circuit: a computer memory chip. Many United States semiconductor companies now rely on Japanese chips for their own line of memory units, finding it advantageous to rely on cheaper Japanese components.

During its field hearings, the panel visited Texas Instruments, Inc., Dallas, Texas and found that not only is the United States losing ground to the Japanese in the world semiconductor market, but that the majority of assembly work done on United States manufactured semiconductor devices is carried on in Malaysia, Singapore, Taiwan, the Philippines, Korea and Hong Kong. Approximately 90 percent of all assembly work on the United States manufactured devices is done offshore. The panel finds this dependence on offshore labor for assembly of critical defense related components as troublesome as our offshore dependence for critical materials.

The panel believes that if solutions are not developed to address the myriad problems that plague the defense industrial base and, indeed, the total industrial base, the United States is in danger of losing its position as the industrial leader of the world. General Slay told the panel, " * * * it is a gross contradiction to think that we can maintain our position as a first-rate military power with a second-rate industrial base. It has never been done in the history of the modern world."

Productivity growth is lagging

One of the more telling indicators of the declining vitality of American industrial might is reflected in productivity growth rates. While the United States leads the world in productivity,³ the United States is *dead* last in productivity improvements among all industrialized nations of the world. This problem of declining productivity growth is compounded by equally troubling quality and reliability

³ Productivity is a measure of the goods and services produced per unit of labor invested, capital invested or both.

problems. The United States no longer leads the world in manufacturing quality standards . . . the Japanese do.

In providing the panel with a net assessment of the capabilities of the U.S. defense industrial base, Dr. Perry stressed the positive features of the base, of which there are many. Dr. Perry told the panel that in terms of technology, cost and productivity, the American defense industry is the best in the world. He went on to note, however, " * * * most of the good things I have said about our industry have resulted from investments that were made in the fifties and sixties, and we are now living off the fat. If we look at the rate of investment in research and development, if we look at the rate of investment in plant modernization, we find very adverse trends, which I think portend poorly for the eighties."

Defense industry has failed to modernize

The panel's record strongly supports Dr. Perry's observation regarding investment. As an example, during the past decade, the U.S. aerospace industry invested approximately two percent of its sales in new capital. The average rate of investment for all U.S. industry during this same period was approximately eight percent and the average rate for all U.S. manufacturing firms was 4 percent. This lack of investment by the defense sector of U.S. industry has resulted in a situation where 60 percent of the metal working equipment used on defense contracts today is over 20 years old. Further, the Defense Department's investment in the future, its technology base, has likewise not kept pace. In real terms, the technology base budget has declined by almost a factor of two during the past two decades.

The Defense Science Board Task Force on Industrial Responsiveness, the Joint Logistical Commanders and Dr. Perry strongly recommended that the Department of Defense pursue a vigorous Manufacturing Technology (MANTECH) program. The Defense Science Board Task Force estimated that a 5 to 1 payback would result from a properly implemented MANTECH effort with industry.

The panel found that the disincentives for investment in new facilities, equipment and technology have resulted from a number of factors. In the defense industry, in particular, the decline in the procurement and research and development budget after the Vietnam conflict placed a serious burden on new investment in defense related work. Put simply, profits within the defense base generally did not sustain new investments. The problem was further compounded by abnormally high, and unanticipated, inflation during the 70's. This high inflation, coupled with high interest rates, further discouraged investment in new facilities and equipment.

In addition to inadequate budgets and soaring inflation and interest rates, the panel believes that tax policies that discourage capital investment, government over-regulation and near-term profit oriented management priorities have seriously constrained industry's ability to generate investment capital. This issue will be treated in detail in a separate section of this report.

DEFENSE INDUSTRIAL PREPAREDNESS PLANNING IS NONEXISTENT

FINDING

The panel finds that the Department of Defense has neither an on-going program nor an adequate plan to address the defense industrial base preparedness issue. Department of Defense inaction in enhancing industrial base preparedness, coupled with instability within the five year defense program, weapon system procurement stretchouts, inadequate budgeting, and inflation, has contributed to the deterioration of the U.S. defense industrial base, and as a consequence, jeopardizes the national security.

The panel specifically finds that:

- the Consolidated Guidance, the planning document of the Department of Defense that delineates U.S. military policy and establishes commensurate force structure, does not address industrial preparedness;
- the current industrial preparedness planning tool used by the Department of Defense (DD Form 1519) lacks realism in establishing the potential of the defense industrial base to expand production of major weapon systems and end items and is an ineffective planning tool;
- The Five Year Defense Plan, the document that sets forth program and weapon system acquisition objectives for a five-year period, lacks stability; weapon system procurement rates are constantly adjusted so that it is virtually impossible for defense industry to do long-range planning and to effect efficient procurement of long-lead subsystems and components; and
- war reserve materiel stocks are at a dangerously low level and can support only the shortest of "short war" scenarios.

DISCUSSION

Concerns about the capability of the defense industrial base have not surfaced overnight. The Joint Committee on Defense Production of the Congress expressed concern in 1975 that the industrial base might not be capable of responding to our military needs. The Department of Defense was also cognizant of the problem and, in 1976, initiated a Defense Science Board (DSB) study group to address defense industrial preparedness. The objectives of the DSB study were to examine the role of the U.S. industrial base in terms of projected wartime and crisis scenarios and to consider approaches for improving the responsiveness of the base to meet these needs.

The DSB final report was published in November 1976. The panel, in reviewing the report, found it to be substantive, hard-hitting and definitive in charting a course that would make the industrial base responsive to our military requirements. The report addressed the

interrelationship of the industrial base with the requirements for various conflicts, crises or wars. It considered warning time, short-to-long war transition, war reserve materiel needs and culminated in a series of recommendations that would indeed have enhanced preparedness. The report delineated the steps that the Department of Defense should take, beginning with policy guidance revisions to include industrial preparedness planning to be responsive to current scenarios, force structure, logistic support requirements and defense industrial base capacity.

Extended awareness of the problem and an excellent DSB report have done little to enhance defense industrial preparedness. When asked about what actions DOD had taken to implement the 1976 DSB recommendations, Mr. Church replied, "As far as specific actions, something between virtually nothing and very little."

The Department of Defense initiated another DSB industrial base preparedness study earlier this year. Many of the 1980 findings are essentially those of 1976. The panel concludes that the Department of Defense has done little to improve the capability of the industrial base in five years, the problem continues to worsen, and new studies are initiated when, in fact, action, not analysis, is what is needed to improve the responsiveness of the base.

Current planning approach is inadequate

The industrial preparedness planning approach used by the Department of Defense lacks realism. It fails to determine the potential of our industrial base to expand production of the weapon systems and end items that are being acquired. The currently used prime contractor industrial planning schedule (DD Form 1519) involves the preparation by the prime contractors of production acceleration estimates. However, the planning efforts of the various prime contractors are not coordinated with each other. Consequently, several primes may be basing their estimates of acceleration capability on the presumed availability of critical materials and subcontractor support. Accordingly, the key element in increasing production may not be the prime's plant capacity but rather the plant capacity at a second or third tier supplier who may already be operating at full capacity.

It is the view of the panel that the Department of Defense needs a more realistic planning device than the DD 1519. In the panel's judgment, the DD 1519 approach in and of itself is an ineffective planning tool and wastes both time and money.

On November 18, 1980 the following scenario was postulated to the panel:

- World tensions heat up;
- SALT negotiations break down;
- The Russians move into the Persian Gulf;
- U.S. military deficiencies are recognized; and
- Congress significantly increases the defense budget but, the defense industry cannot rapidly respond with needed increases in military equipment.

This 1980-like scenario was first postulated in 1975 by Dr. Jacques S. Gansler, then Deputy Assistant Secretary of Defense for Materiel Acquisition. On November 18, Dr. Gansler advised the panel, "That (the postulated scenario) was five years ago, and at that time, I con-

cluded that corrective actions were required. The scenario is far more plausible, but no actions have been taken so the conclusion remains the same, only today the need is more urgent."

The panel is deeply concerned that the Department of Defense has failed to take corrective action on known deficiencies or even initiate policy revisions and plans that would make the industrial base responsive to our military needs. The panel finds an alarming trend in the Department of Defense approach toward current day problem solving—that of "rationalizing the problem out of existence." The Department's response to our dangerously low level of force structure is to adjust the Consolidated Guidance to accommodate only a short war. The short war syndrome, which shows the war ending before the industrial base can respond, negates the need for industrial base planning, hence, the need for funds or programs to enhance the base is "rationalized away." This is clearly evidenced by the Department's inaction on the excellent Defense Science Board (DSB) findings and recommendations in 1976. Not a single witness who appeared before the panel disputed the DSB findings. Rather than use the findings, however, the Department initiated another DSB study in 1980. The findings and recommendations of the 1980 DSB study merely echoed those of 1976. Quoting the 1980 report:

The conclusions reached and the majority of the actions recommended are as valid today as they were in 1976. Unfortunately the 1976 report was submitted just after the Presidential election, and if there were advocates for taking action, they disappeared when the players changed. The 1980 Task Force found that very little had changed in four years, with the exception of some improvement in conventional ammunition War Reserve Materiel stocks.

The panel is extremely troubled that an issue as important as industrial preparedness could be "lost" during a Presidential transition and that the problem has not been aggressively pursued during the past four years.

Chairman Ichord summarized the panel's concern when he noted:

*** one of the things that troubles me most about the situation is the apparent lack of a long-range strategic plan for industrial preparedness at the Department of Defense. We have received testimony that clearly indicates that the Consolidated Guidance—the planning document used by the Department of Defense to establish its force structure—does not even address industrial preparedness. Instead, the Consolidated Guidance sizes our defense production base on the assumption that all future wars will be "short wars." That is, these wars will have to be fought with equipment that is on hand when the war starts because it is assumed that the time to activate the production base would exceed the term of the "short war." That seems to me to be a self-fulfilling prophecy. If we plan for a "short war" and make no plans for a "long war", then surely all future wars will be "short wars."

I can understand how intelligent men can differ on whether we should plan for "short wars" or "long wars" but I am

greatly concerned that we are not even buying the required ammunition, equipment, and weapon systems to support a short war policy. Even a cursory look at the equipment currently in the hands of our troops, at our war reserve materiel stockpiles, and at our Five Year Defense Program is proof positive of this claim.

There are some pluses, but on the dark side of the ledger, our troops are outmanned and outgunned at every turn, our war reserve materiel stocks are woefully inadequate today to support all but the shortest of "short wars," and the current Five Year Defense Program does little to improve the situation.

Policy guidance should consider industrial preparedness

The panel believes that the appropriate action required to enhance defense industrial preparedness should begin with Department of Defense policy revisions to the Consolidated Guidance. The panel concurs in the DSB recommendation to issue guidance revisions by which the industrial preparedness planning process is carried out to make such planning consistent with the current scenarios, force structure, logistic support requirements and defense industrial base capacity. Adm. Alfred J. Whittle, Jr., Chief of Naval Material, told the panel that the Consolidated Guidance should be revised to provide for industrial preparedness planning. Gen. John R. Guthrie, Commanding General, U.S. Army Materiel Development and Readiness Command, likewise advised the panel that any assessment of the capability of the industrial base to support Army as well as other service requirements must begin with the Consolidated Guidance. Dr. Perry agreed that revisions are in order and told the panel he plans to incorporate industrial base planning in the Consolidated Guidance.

Consolidated guidance must be stabilized

The revision of the Consolidated Guidance to include industrial preparedness planning is only a first step in making the industrial base responsive to our military needs. In recent times, funding constraints have caused instability in the establishment of our national security policy. This instability disrupts the Five Year Defense Plan, which in turn, creates turmoil in the industrial base. Consequently, the base tends to atrophy, war reserve materiel replenishment is deferred for another year and weapon systems costs increase as a result of inflation and inefficient procurement practices. Since the military requirement for these systems and force structure is not diminished, the "defense mortgage" is greatly increased and extended in time. Consequently, the Department of Defense enters a revolving door from which it is difficult—and becoming impossible—to escape.

The panel believes that the Consolidated Guidance must be stabilized to avoid reaching the point of no return. No one has the clairvoyance to predict the requirements, characteristics or duration of the next war. However, the massive Soviet force structure and the quantitative advantage the Soviets hold over the United States—18 to 1 in surface-to-air missiles, 11.5 to 1 in armored vehicles and artillery pieces, 2 to 1 in tactical aircraft, naval surface combatant ships and

submarines—makes the ability to surge production extremely important.

Further, not only is there a lack of surge capability, there is even an indication that the defense industrial base is incapable of producing some of the hardware in the Five Year Defense Plan. As an example, the panel was advised by Dr. Allen E. Puckett, Chairman and Chief Executive Officer of Hughes Aircraft, that his company, one of only a few producers of mercury cadmium telluride detectors for Forward Looking Infrared sensors, cannot produce these detectors in sufficient quantity to meet the Army's existing requirements for the XM-1 tank.

The importance of stability in the five-year defense plan

The panel believes that providing for defense industrial preparedness planning during the formation of the Consolidated Guidance, together with introducing greater stability in this phase of force structure planning, is the first step toward industrial base enhancement. Once this is achieved, the Five Year Defense Plan must be stabilized through multiyear commitments to important programs at the very least, and where desirable, through multiyear contracting. A recent report, "Review of Price Changes in Department of Defense Weapon Systems," published on December 1, 1980 by the firm of Coopers and Lybrand under a Department of Defense contract, stated that the aggregate rate of price increase (percentage until price change weighted by base year procurement amounts for all systems) was 15 percent between fiscal years 1979 and 1980. The Department of Defense estimate presented to the Congress in support of the fiscal year 1979 military budget request was 7.9 percent.

Historically, the Department of Defense is directed by the Office of Management and Budget to use inflation indices that are not in fact representative of actual economic conditions. This unrealistic budgeting is one of the root causes of confusion in the Five Year Defense Plan. Short of coming back to the Congress for additional appropriations to cover actual inflation, the Department of Defense can only select alternatives that adversely affect our military capability and the industrial base. The typical alternative chosen in previous years has been either to stretch out programs or defer replenishment of the war reserve materiel stocks. In either case, the industry simply cannot carry on realistic long-range planning. While the prime contractors suffer from this instability, it is the lower tier subcontractors, with limited capital, that are hit the hardest.

Action, not studies, will enhance industrial base preparedness

The production know-how and capacity of our industry have historically been the backbone of our military capability. However, today not only our ability to surge, but our ability to meet the requirements of the Five Year Defense Plan, is called into question.

The panel believes that the fundamental problem that the U.S. defense establishment faces is that, for a substantial time, military requirements have far exceeded the funds made available to meet these requirements. The panel concedes that greater financial resources are required. In addition, however, other steps can be taken to improve the overall industrial capability through proper planning.

The starting point for this improvement is, in the panel's judgment, a reassessment and reaffirmation of our national security policy. Once our national policy objectives are established, the panel believes that the Department of Defense can better delineate military requirements and the weapon systems that must be developed and procured to meet these requirements. This, in turn, will establish the budget required to satisfy our national security needs. At this point, requirements will have to be matched with fiscal realities. The panel believes that this approach will minimize the turbulence that exists in the policy and planning process.

In summary, the panel believes that the Defense Science Board findings and recommendations of 1976 and 1980 chart the proper course toward making our industrial base responsive to our current and projected military requirements. The recommendations, if acted upon, would greatly stabilize the Department of Defense policy, planning and acquisition process. Action, not additional studies, is what is urgently needed if our national security objectives are to be realized.

CRITICAL MATERIALS AVAILABILITY THREATENS DEFENSE CAPABILITIES

FINDING

The panel finds that a shortage of critical materials, combined with a resulting dependence on uncertain foreign sources for these materials, is eroding the foundation of U.S. defense capabilities. These shortages are a monumental challenge to the Congress, the Department of Defense, the defense industry and the civilian economy.

The panel specifically finds that

- the United States is heavily dependent on other nations for supply of critical materials;
- the United States does not have an effective national non-fuel minerals policy that promotes U.S. national security interests;
- the United States government still knows little about the total potential mineral resources of this country;
- trends toward excessive and unreasonable government regulations are stifling and crippling the basic mineral industries of the United States; many critical minerals exist in the United States within the 750 million acres of public lands, but because of restrictive laws and regulations, mining is either prohibited or economically unfeasible;
- the stockpile of strategic and critical materials is woefully inadequate to meet the requirements of the defense industrial base as required by the Strategic and Critical Materials Stock Piling Act, (50 U.S.C. 98);
- many of the materials now in the strategic stockpile need to be upgraded to forms that will incorporate the maximum energy conversion costs, thereby expediting their use in time of emergency; and
- the United States has not effectively utilized Title III of the Defense Production Act of 1950 (50 U.S.C. App. 2061), which authorizes the government to expand domestic supply and productive capacity of vital resources and to explore for, develop and produce those domestic materials that could relieve the dependence on many uncertain foreign sources.

DISCUSSION

All of the witnesses appearing before the full committee and the defense industrial base panel expressed extreme concern over the United States growing dependence on foreign sources for critical materials. The panel can add little to the presentations made by Gen. Alton Slay and Representative Jim Santini on the critical materials issue.

General Slay summarized the grim situation facing the United States when he told the panel:

There was a time when we produced more raw materials than we consumed. Since 1950, however, our raw materials situation has deteriorated drastically. We have now become dangerously vulnerable to the OPEC-type mineral cartels. The dangers of a high dependence on foreign sources for any item essential to our nation's survival can be best illustrated by the OPEC oil cartel which caused: price escalation, shortages, inflation, dollar devaluation, trade deficits, and economic stagnation. While oil is the best known and the most important single commodity subject to possible cartel-type actions, it is not the only one.

Much of the world's production and reserves of a number of our critical materials are located in two areas of the world: Siberia and southern Africa. These two areas contain 99 percent of the world's manganese ore; 97 percent of the world's vanadium; 96 percent of the world's chrome; 87 percent of the world's diamonds; 60 percent of the world's vermiculite; and 50 percent of the world's fluorspar, iron ore, asbestos, and uranium. Zaire and Zambia now provide 65 percent of the world's cobalt.

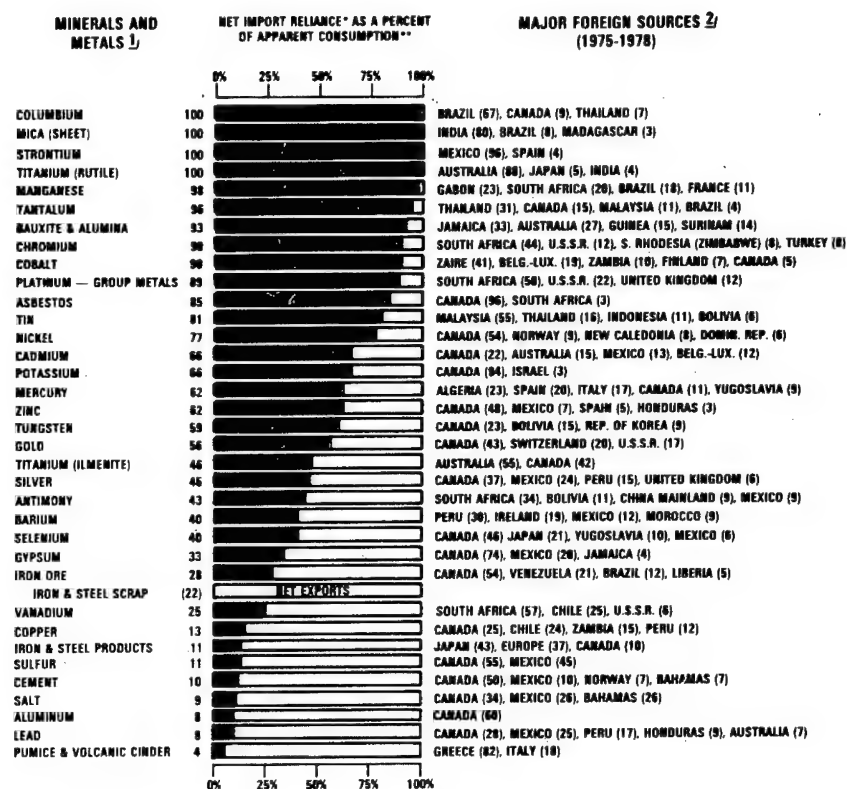
The United States is more than 50 percent dependent on foreign sources for over half of the approximately 40 minerals which have been described as most essential to our \$2.3 trillion economy.

Last year, the United States had to import over \$25 billion worth of non-fuel minerals. This dependence on foreign sources for raw materials vital to our industries has been increasing for many years for several reasons including: technology advancements and legislative and regulatory restrictions imposed on the U.S. mining industry.

Our strategic vulnerability is obvious. On one hand, critical materials availability is subject to the political and economic stability of several southern African nations. On the other hand our chief remaining source is also our major international rival—the Soviet Union.

Figure 1 clearly shows the degree to which the United States has become dependent on other nations for many of critical materials so essential to the U.S. economy.

U.S. NET IMPORT RELIANCE OF SELECTED MINERALS AND METALS AS A PERCENT OF CONSUMPTION IN 1979



*NET IMPORT RELIANCE = IMPORTS-EXPORTS

**ADJUSTMENTS FOR GOVT AND INDUSTRY STOCK CHANGES

**APPARENT CONSUMPTION = U.S. PRIMARY

-SECONDARY PRODUCTION + NET IMPORT RELIANCE

^{1/} SUBSTANTIAL QUANTITIES ARE IMPORTED FOR FLUORSPAR, GRAPHITE, RHEINIUM AND ZINC. DATA WITHHELD TO AVOID DISCLOSING COMPANY PROPRIETARY DATA.

^{2/} SOURCES SHOWN ARE POINTS OF SHIPMENT TO THE U.S. AND ARE NOT NECESSARILY THE INITIAL SOURCES OF THE MATERIAL.

APRIL-1980

BUREAU OF MINES, U.S. DEPARTMENT OF THE INTERIOR
(IMPORT-EXPORT DATA FROM BUREAU OF THE CENSUS)

FIGURE 1

Policy impact on critical materials availability

Mr. Santini stressed that many aspects of our foreign policy have been inconsistent with our critical material needs. He pointed out that many of the countries from which the U.S. imports essential minerals are now calling for a new international economic order, the right to nationalize, expropriate or transfer ownership of foreign property and exploit market forces to their advantage. As a result, few new western-mining ventures are being undertaken in these mineral-rich underdeveloped nations.

In summarizing his subcommittee's report, entitled "U.S. Minerals Vulnerability: National Policy Implications," Mr. Santini told the panel the United States currently lacks an effective national non-fuel minerals policy. He said "Our foreign policy has not been in tune with the reality that is shaping the nature of the United States dependency or that of the free world. It is imperative that foreign policy, therefore, emphasize the legitimate economic interests of the United States as a significant element of its national security interests. We must have an economic strategy for our relations with foreign nations that will give higher priority to mineral security aspects of those relations. We cannot wait until we are irrevocably trapped. Our foreign policy must work to reestablish traditional economic concepts under international law."

The Congress, responding to this lack of policy direction, recently enacted the National Materials and Minerals Policy, Research and Development Act of 1980, Public Law 96-479. The Act provides for a national policy to promote an adequate and stable supply of materials necessary to maintain national security, economic well-being and industrial production. The Act requires the President to report to Congress by October 21, 1981 his program plan to implement and carry out the national materials policy. While a step in the right direction, much remains to be done if an effective non-fuel minerals policy is to be implemented.

Excessive stifling and unreasonable governmental regulations

Approximately one-third of the nation's lands, some 750 million acres, are publicly owned. While these publicly owned lands have a huge mineral potential, little has been done to exploit it. Mining uses less than 6 million acres of U.S. lands. In contrast, farm lands use 1.3 billion acres, highways cover 24 million acres and airports and railroads cover 6.5 million acres.

In addressing the failure of the United States to tap the nation's mineral resources, Mr. Santini told the panel:

Our Government, over the past 10 years, has made fundamental errors with respect to use or nonuse of public lands for mineral development. Instead, Government policies have proven to be counterproductive and discouraging to the discovery and development of mineral deposits. We have put every conceivable roadblock in the way.

The most deplorable aspect of this shortsightedness about public land use is that it is being done without knowledge of the losses involved. There has been no attempt to understand

the long-term impacts. There is no government accountability to weigh the consequences. There have been numerous instances where public lands have been withdrawn when they were known to have mineral potential.

In 1974, one study estimated that we had prohibited or restricted mineral development under the mining law on two-thirds of our public lands.

We hear a lot of "regulatory reform", but all I have seen to date are cosmetic references to that phrase. The most difficult thing for me to grasp is that our dedicated but tunnel-vision regulators will be satisfied with nothing short of perfection. They refuse to even consider the alternatives. Perfection becomes a safe refuge in the bureaucratic process. It has created the expectations in the public mind that the only safe standard is "zero risk".

General Slay echoed Mr. Santini's concern over the growing restrictions on the U.S. mining industry by noting:

The list of federal restrictions on mineral exploration is extensive. They include land management and land use restrictions, such as the Clean Air Act, Federal Water Pollution Control Act, Wilderness Act, Federal Land Policy and Management Act, and the Surface Mining Control and Reclamation Act.

Currently, there are 80 different laws administered by 20 different federal agencies which directly or indirectly affect the domestic non-fuel minerals industry. The complex regulatory processes, the Government demand for data, and the environmental, safety and health requirements often prevent companies from starting new operations or expanding existing capacity.

Strategic and critical materials stockpile inadequate

The Strategic and Critical Materials Stock Piling Act, originally enacted in 1946, provides that strategic and critical materials will be stockpiled in sufficient quantities to sustain the United States for a period of not less than three years in the event of a national emergency. During the period 1946-1960, materials were actively procured for the stockpiles. However, in 1962, the size of the stockpile was considered excessive and in the following years large amounts of the accumulated commodities considered to be in excess of revised goals, were sold.

From 1946 to 1979, stockpile policies have changed direction many times with many changes in the established goals for individual commodities. During the period 1964 to 1975, stockpile holdings of some commodities, such as copper, aluminum, and nickel, were liquidated.

Today, the stockpile holdings of many materials that are vital to our national security needs are far below stated requirements; 60 percent of the 62 family groups and individual metals called for do not meet their goals. Mr. Paul Krueger, representing the Federal Emergency

Management Agency (FEMA), the agency with responsibility for the stockpiles, told the panel that the raw materials currently in the stockpile are valued at \$13 billion, compared to a desired inventory valued at \$18 billion. However, of this \$13 billion worth of materials on hand, only \$7 billion worth represents needed materials, the remaining \$6 billion is considered excess to national security needs.

The declining posture of the stockpile has resulted not only from a failure of successive Administrations to request, or the Congress to appropriate, funds to make purchases for the stockpile, but also from a failure to replenish the stockpile from the revenues generated from the sale of commodities from the stockpile. During the 1960's and 1970's, large sales were made from the stockpile. Frequently, these sales were made for the purpose of helping to balance the federal budget. Instead of being used to buy badly needed materials such as cobalt, titanium, platinum and tantalum, the revenues derived from these sales were transferred to the general fund of the U.S. Treasury for other uses. With the exception of minor additions of chrysotile asbestos, jewel bearings and small diamond dies, no major addition has been made to the stockpile since 1960. The panel believes that, with the support of the Executive Branch, the recently enacted Strategic and Critical Materials Stock Piling Revision Act of 1979, Public Law 96-41, will help improve the strategic stockpile posture.

Stockpile in need of upgrade

Many of the materials currently in the stockpile should be upgraded or reprocessed to be usable. As a matter of prudence, the panel believes many materials need to be converted from the ore state to the primary metal or alloy. The best examples are the conversion of bauxite to aluminum, chromium to ferro-chrome and manganese to ferro-manganese. Through these conversions, energy is stored and the materials are then readily available for use without further processing.

The purpose of the critical materials stockpile is to protect against critical material shortages in times of national emergency. Further, the stockpile is intended to reduce lead times and demands on manpower, energy, production capacity, scarce machinery, and transportation incident to mining and processing that would otherwise create additional demands in a war time environment.

The panel believes that current stockpile goals are much too low. In view of the complexity of international relations and political alignments over which the United States has no control, and of the general trend toward resource nationalism, the panel believes the United States should reevaluate its stockpile goals, placing more emphasis on having the bulk of its three-year emergency requirement for critical materials available within the United States, either from domestic capacity or in its stockpiles.

At the current import rate of non-fuel minerals, some \$25 billion worth a year, three years of imports would be valued at \$75 billion. In contrast, the current stockpile goal for three years of material is only \$18 billion. In a time of national emergency, the panel concludes, the nation's mineral needs would not be satisfied if imports were seriously curtailed * * * not an unlikely occurrence in a protracted conflict.

Title II, Defense Production Act

The Joint Logistics Commanders,⁴ Dr. Perry, and representatives from the Department of Commerce and FEMA recommended that the broad authority provided under the Defense Production Act should be used to address many of the critical materials problems facing the nation. The Act provides the authority to expand " * * * productive capacity and supply beyond the levels needed to meet the civilian demand, in order to reduce the time required for full mobilization * * * ." Title III of that Act authorizes the use of Government loans, loan guarantees, purchase commitments, guaranteed production levels, and guaranteed prices to achieve these goals.

During the 1950s and 1960s, extensive use was made of the Defense Production Act. However, during the past decade little use has been made of the Act. The panel believes that the Act needs to be utilized to assist in the development of new materials and in the exploration and production of domestic sources of minerals that can relieve the U.S. dependence on many uncertain foreign sources for these minerals.

⁴ The Joint Logistics Commanders are : Commander, U.S. Army Materiel Development and Readiness Command ; Commander, U.S. Air Force Logistics Command ; Chief of Naval Material ; and Commander, U.S. Air Force Systems Command.

CONTRACTING PROCEDURES ARE EXCESSIVELY RESTRICTIVE

FINDING

The panel finds that present policies and procedures for the procurement of property and services by the Department of Defense are excessively inflexible and discourage the use of contract types that would promote the best interests of the United States. As a result, many procurement contracts cannot be written that would promote stability, encourage capital formation, and lead to efficiencies that would result in savings to the government.

The panel specifically finds that

- existing restrictions on advance procurement, multiyear contracting, including restrictions on the extent and content of cancellation ceilings, and funding of defense contracts, are unrealistic in view of the economic realities that now prevail in the defense industrial base;
- subject to the controls inherent in the authorization and appropriation process, multiyear contracting for advance procurement for the purpose of obtaining economic lot purchases will reduce costs, encourage program stability and enhance the defense industrial base; and
- the use of multiyear contracts to procure property and services (other than construction, alterations or major repair of real property) for periods normally not exceeding five years would offer maximum economies to the government at little additional risk.

DISCUSSION

The panel was impressed by the recommendations of the witnesses representing the Department of Defense (DOD), industry, the Joint Logistics Commanders, the General Accounting Office, the Defense Science Board and the Department of Commerce that current procedures and policies relating to defense procurement should be made more flexible. Specific recommendations are as follows:

- Expanded application of the multiyear contracting procedure including the authorization of such contracts funded by single year appropriations;
- Repeal of section 810 of Public Law 94-106, which places a \$5 million ceiling on cancellation costs in multiyear contracts; or increase the cancellation costs ceiling by severalfold;
- Relief from the so-called "full funding policy" which now effectively confines procurement contracts to those usable end items that can be placed under single year contracts supported by annual appropriations;

- Expanded application of the advance procurement concept through multiyear contracting for long lead items and for the purpose of obtaining economic lot quantities;
- Permit the recovery of recurring costs (labor and material) in the cancellation ceiling included within multiyear contracts;
- Require the Department of Defense to identify candidate programs for multiyear procurement, and to indicate the most efficient and economical production and acquisition rates for weapon systems or components contained in the Five Year Defense Plan;
- Establish criteria for multi-year contracting.

The basic policy which underlies the Armed Services Procurement Act (10 USC 2301 et. seq.) is that purchases of and contracts for services and property for the military departments will be subject to competition where practicable. Except where one of 17 exceptions set forth in section 2304 of title 10 applies, procurement must be by formal advertising. Where permitted by law, procurement contracts may be negotiated and, with the exception of the cost-plus-a-percentage-of-cost system of contracting, " * * * the head of an agency * * * may make any kind of contract that he considers will promote the best interests of the United States." There is no general prohibition within the law against the making of multiyear contracts through formal advertising or through negotiation.

Multiyear contracting

Multiyear contracting was authorized by Armed Services Procurement Regulation (ASPR) in 1963, and is now authorized by paragraph 1-322 of the Defense Acquisition Regulation (DAR). The legality and propriety of this contracting method have been confirmed by the Comptroller General on several occasions.⁵ The concept has been successfully applied in past DOD procurements and is generally applied in the case of federal public works projects.

At this point, it is appropriate to define the panel's understanding of what multiyear contracting entails. The panel understands that this device involves the making of contracts, under competitive conditions if practicable, for the procurement of quantities not in excess of known requirements, for up to five years in support of programs set forth in the Department of Defense Five Year Defense Plan. Multiyear contracts may be entered into even though the total funds ultimately expected to be obligated under the contract are not available to the contracting officer at the time that the contract is made. Contract quantities are budgeted, authorized and appropriated for in the amounts required during each program year. Further, a multiyear contract may authorize a defense contractor to expend funds for materials, tooling, parts and the application of labor that apply to the total quantities of end items planned for acquisition, rather than limiting the contractor's expenditures to those items relating only to quantities ordered and funded in a single year. Multiyear contracts would normally contain a provision whereby the contractor would be paid a cancellation charge representing preproduction, start-up and other (material and labor) costs that would normally be amortized in the price of all items to be furnished under the multiyear

⁵ 43 Comp. Gen. 215, 43 Comp. Gen. 657, 46 Comp. Gen. 749, 48 Comp. Gen. 103.

contract. The cancellation provision would become operable if the requirement for the contractor's performance in the follow-on years disappears or if the Congress fails to provide additional funding for the contract. The cancellation charge can be paid from existing appropriations or from funds appropriated for such payments.

Benefits of multiyear contracting

During the panel's hearings, a broad range of witnesses unanimously agreed that multiyear contracting for defense requirements can result in substantial benefits for both the government and industry, including small business. The chief benefit to the government cited by the witnesses is the potential for reducing short-term costs, while improving the industrial base to avoid higher costs in the future.

If the government is able to offer a long-term production contract, the competitive base is broadened, economies of scale are possible, a higher learning curve can be established, the work force is more stable, and the contractor has an incentive to invest in labor-saving machinery and innovative production techniques. In summary, productivity is increased. In addition, costs can be reduced through the ordering of materials, parts and components in economic lots. Further, the inefficiencies of program starts and stops are avoided.

Ancillary benefits to the government involve enhanced standardization, particularly in parts and components which under current procedures may be obtained from a different contractor each year; reduced administrative costs by avoiding multiple one-year contracts; and more consistent production quality. Moreover, where the contractor responds to the incentive to modernize his facilities, improved industrial capacity will be available for future defense orders.

As noted elsewhere in this report, United States industry is operating in an environment of scarcity in many critical and strategic raw materials. Domestic and international competition for these materials, and for manufacturing capacity, has resulted in high rates of inflation and lengthening lead times which add to the cost of weapon systems and delay production. The evidence before the panel clearly shows that current methods and policies for procurement and budgeting within the Department of Defense are inadequate to deal with the problems at hand. Dealing with a multiyear problem on the basis of a single year's procurement slice defers any solution and aggravates the problem's ill effects on costs and production.

Previous recommendations for multiyear contracting

Recommendations for expanded use of multiyear contracting did not originate in the testimony before this panel. The Commission on Government Procurement was established by Congress in 1969 to study and report its recommendations on methods to achieve "economy, efficiency and effectiveness" in procurement by the Executive Branch of the government. In its December 31, 1972 report to the Congress, the Commission recommended that the Congress enact legislation authorizing all executive agencies to enter into multiyear contracts for supplies and services *with annual appropriations*. The General Accounting Office (GAO), following a 1977 study of multiyear contracting, made almost identical recommendations to the Congress and the Executive Branch. The GAO, in its November 8, 1979 report, *Impediments to*

Reducing the Costs of Weapon Systems (PSAD-80-6), again recommended expanded multiyear procurement. The DOD Investment Policy Group report, approved by the Deputy Secretary of Defense on February 10, 1978, identified multiyear contracting as a technique to encourage capital investment by defense contractors. In addition, the Defense Science Board, in its 1976 and 1980 findings, recommended multiyear contracting in appropriate cases and the removal of several existing impediments to this contracting device. The panel also notes that in the Department of Defense Annual Report, Fiscal Year 1981 (page 252), Secretary Brown stated:

* * * We are considering implementation of several recommendations for reducing unit cost made by the Defense Science Board. These include enhancing program stability through long term funding commitments, increasing use of competition, and greater attention of product improvements in lieu of developing new systems.

The Joint Logistics Commanders have estimated that an expanded and more flexible multiyear procurement approach can provide savings of 10 to 15 percent. In one program alone, the TR-1 aircraft, the use of a multiyear approach can, according to the Commander, Air Force Logistics Command, avoid an 86 percent increase in costs compared to the currently-approved annual procurement plan.

The panel finds that, while there are legal and administrative provisions for multiyear contracting, certain impediments prevent the full use of the principle in cases where potential cost reductions would be the greatest—i.e. major weapon systems acquisitions and advance procurement of critical materials.

Limitation on cancellation costs provisions

Section 810 of Public Law 94-106 (The Department of Defense Appropriation Authorization Act, 1976) is as follows:

“No funds authorized for appropriation to the Department of Defense shall be *obligated* under a contract for any multiyear procurement as defined in section 1-322 of the Armed Services Procurement Regulations as in effect on September 26, 1972, where the cancellation ceiling for such procurement is in excess of \$5,000,000 *unless the Congress in advance approves such cancellation ceiling by statute.*” (emphasis added)

The net effect of the \$5 million ceiling imposed by section 810 has been to restrict the use of multiyear contracting to a small number of low value contracts. Since program planning, budgeting, and contracting processes within the Department of Defense are not synchronized with the authorization and appropriation process within the Congress, it is a practical impossibility to identify a program, establish a level of funding, obtain bids or negotiate a contract, and then obtain a statutory exception for a particular contract. Section 810 has not been incorporated in the United States Code but is considered to be permanent law by the Department of Defense. Its restrictive provisions have been included in Office of Management and Budget (OMB) Circular A-11 and in Defense Acquisition Regulation (DAR) 1-322.

As previously stated, a multiyear contract is used for the purpose of procuring planned requirements for more than one year without necessarily having the total funds available at the time the contract is made. Contract quantities are budgeted for and financed for each program year. Certain costs are amortized over the entire number of end items to be produced, and unescalated unit costs are the same for items delivered in each contract year. Since contractors must incur certain costs that pertain to the production of all items during the life of the multiyear contract, a mechanism is required to protect them from loss in the event of contract cancellation after the first year. These costs are expected to be recovered as the end items are produced. This protection is provided through contract provisions that allow reimbursement for costs that would have been recovered in the prices of items that have been cancelled—a "cancellation clause."

"Cancellation" of a multiyear contract means the cancellation of the *total* requirements of *all remaining years* covered by the contract. Cancellation occurs when the contracting officer notifies the contractor that funds are not available to pay for contract performance for any subsequent contract year, or if the contracting officer fails to notify the contractor that funds are available to pay for performance in a succeeding year.

Cancellation ceilings are reasonable estimates of the cost of plant and equipment rearrangements; special tooling and test equipment; preproduction engineering; initial rework; initial spoilage; pilot runs; cost of facilities; costs for assembly, training and transportation of a special work force; and unrealized labor learning. The cancellation clause in a contract establishes the government's *maximum* liability in the event of cancellation. Since these costs are amortized as contract performance progresses, the government's exposure to liability for cancellation costs decreases with each year of performance.

The panel agrees with the collective opinion of the many experts in defense procurement that the ceiling of \$5 million on cancellation costs should be eliminated because it serves to prohibit contracting officers from making contracts in the best interest of the United States. As now constrained, the multiyear contracting technique can be applied to only a small number of relatively low-value contracts where the potential for savings is low.

The legislative history of section 810 reveals that the provision was an outgrowth of concern by the House Committee on Armed Services about two total-package, multiyear shipbuilding contracts—the LHA and DD-963. The contracts, for the design, development and construction of 9 LHA and 30 DD-963 vessels, were awarded on the basis of competition to a contractor with limited shipbuilding experience. The vessels were to be built in a new shipyard utilizing series production techniques for the first time. These were high-to-medium risk programs with respect to both ship design and production techniques. A series of problems caused delays in the LHA program. These problems were intensified by the reduction of sealift requirements by the Secretary of Defense and the directed cancellation of four of the nine LHA ships. This cancellation required that the unamortized costs of the entire program be applied to only five ships instead of nine, substantially increasing units costs.

While the LHA and DD-963 programs were special and unusual cases, which occurred in a different economic environment, it is unlikely that a total package multiyear contract would be used for similar purposes today because of the requirement that the design must be stabilized before such a contract is made.

In view of the discouraging effect that the \$5 million cancellation ceiling has had upon multiyear contracting, the panel believes that the ceiling should be removed or adjusted.

Recurring and nonrecurring costs

A second impediment to a more realistic application of multiyear contracting is the content of a contractor's (subcontractor's) protection against cancellation. As noted above, the cancellation ceiling may provide for payment of the contractor's costs for preproduction or start-up, labor learning and other *nonrecurring* costs applicable to all items and services to be furnished under a multiyear contract. However, DAR 1-322 provides that the contractor may not recover: "*any costs of labor or materials, or other expenses, which might be incurred for performance of subsequent program year requirements.*" (emphasis added) The contractor cannot recover *recurring* costs.

As the expert witnesses testified, this prohibition against the recovery of recurring costs would prevent the achievement of maximum savings through multiyear contracting even if the Congress increased or removed the \$5 million cancellation ceiling. The panel finds that the inclusion of recurring labor and material costs in the cancellation ceiling can encourage longer-term contracting and avoid significant costs to the government. Under current regulations, a defense contractor is not authorized or obligated to incur costs for labor, materials or components that apply to work to be done subsequent to the current program year. If the contractor would take advantage of market conditions by ordering scarce materials earlier to assure their availability or to escape the effects of inflation, to take advantage of economic order quantities, invest in labor-saving equipment, or maintain a stable work force, thus lowering the government's costs, he must do so at his own risk. Understandably, contractors are becoming more and more unwilling to assume this risk.

Unfunded advance procurement

The business realities of the real world, where major defense acquisition programs are involved, are characterized by a seller's market, an ailing industrial base, competition from civilian procurement, a rising cost of money, competition for skilled workers, high inflation rates, and uncertain defense budgets. To maintain delivery schedules and program continuity, defense contractors are forced to buy a place in line years ahead of the fiscal year in which end items are actually purchased. Examples of items requiring advance obligations by contractors are components, forgings, castings, aluminum, titanium, and support equipment. Since current policies inhibit the ability of the Department of Defense to protect production schedules through adequate advance funding, defense contractors are either exposed to longer periods of unfunded financial risk or forced to delay deliveries. Because of increasing costs of materials and components, the increasing cost of money, program instability, and, in some instances,

cash flow problems, defense contractors are becoming more hesitant to assume financial risks for which they believe they are uncompensated.

The panel believes that if the government is to take advantage of the considerable potential benefits of a more stable base of supply and opportunities to avoid additional inflationary costs, it must be prepared to share the additional risks that now rest with the contractor and for which the contractor is not compensated. The panel was unable to find any logical reason for the exclusion of recurring costs from multiyear contracts and can only conclude that the DAR provision in that instance is an overcautious approach to the matter and should be eliminated.

The "full funding" principle and advance procurement funding

"Full funding" is a principle agreed to by DOD and the appropriations committees in budgeting for and providing funds for items covered by the procurement title of annual DOD appropriations acts. Under this principle, each annual appropriation request must contain *all* of the funds *estimated* to be required for the *total costs* to be incurred in completing the delivery of a *given quantity* of *usable end items*. While the principle has never been incorporated into law, it has nevertheless been incorporated into OMB Circular A-11 and DOD Instruction 7200.4, dated October 30, 1969.

"Advance procurement" funding for the purchase of long lead time components in advance of the fiscal year in which the related end items are to be funded is a recognized exception to the full funding principle, and is incorporated in DOD Instruction 7200.4.

While the full funding principle has not been universally applied to other areas of the federal government, it has been justified for several reasons in the case of defense procurement, as follows:

- A demonstrated joint commitment by the Congress and Executive Branch to a specific procurement;
- Visibility of the total costs of specified end items;
- No commitment to future procurement by the Executive Branch or future Congresses;
- Maximum flexibility to increase or decrease programs;
- All funds are in the hands of the Executive Branch, including estimated costs, cost growth and inflation; and
- Reduced requirements for program reviews.

The full funding principle is said to have many benefits which make its continued use desirable for most programs. Shipbuilding programs, for example, which span a number of years, particularly benefit from the availability of an appropriation of all estimated necessary funds prior to the commencement of construction. Full funding is also desirable where program schedules are not stable and where programmatic changes are highly probable.

While no witness before the panel advocated that full funding be abandoned as a general principle, all of those who addressed the issue strongly recommended that the Congress and the Executive Branch apply the principle with greater flexibility. The panel agrees with this recommendation based upon evidence that a strict adherence to full funding can be much more costly than the expected benefits. For exam-

ple, full funding does not permit a stable procedure for the advance procurement of materials, piece parts, subassemblies and components that will be used in the production of end items in subsequent years. In the absence of some relief from full funding requirements, neither the benefits from multiyear contracting nor the economies of advance procurement can be fully realized by the government. Specific recommendations for *exceptions* to full funding received by the panel included: procurement of materials and other items two or more years in advance; permitting multiyear contracting for property and services from one year appropriations in selected cases; relaxing restrictions on the content and extent of contract cancellation clauses; and, permitting funding to "termination liability" limits in selected cases.

It has been argued that in the absence of full funding for procurement programs the government risks being left with no usable end items (aircraft, spare parts, engines, etc.) in case a contract is cancelled. The panel accepts the possibility of this risk but believes that the degree of risk can be minimized by restricting the application of multiyear contracting to programs which are stable and unlikely to be cancelled. Even in those cases where a contract may be cancelled the panel believes that the costs of cancellation can be greatly reduced by the diversion of unused materials to other uses, the sale of other assets, and the use of components where possible as spares. The panel believes that the actual experience of the Department of Defense has shown that the probable savings from a relaxation of the full funding principle are sufficient to overshadow the risks and that the risks are small.

The panel does not believe that multiyear contracting, liberalizing advance procurement procedures, or exceptions to the full funding principle are, within themselves, a panacea for the ills now afflicting the industrial base or the procurement of property and services for the Department of Defense. The panel does believe, however, that the removal or amendment of overly restrictive laws and regulations would result in substantial savings to the government, the value of which outweighs the benefits of those laws and regulations. The panel's recommendations are designed to achieve this objective.

Restrictions on advance procurement

To accomplish the possible savings incident to more prudent and businesslike advance procurement for major weapons systems, the military services must have relief from regulations that now apply. First, advance procurement has effectively been limited to a single year in advance of the year in which procurement funds are requested. Second, advance procurement has been limited to fully funding a given quantity of usable end items. Consequently, materials and parts cannot be bought in advance to avoid higher costs. Third, advance procurement policy now restricts advance procurement funding to a small percentage of total long lead requirements.

As currently structured, advance procurement regulations do not permit the most efficient use of appropriated funds. The regulations reflect the condition of the defense marketplace of several years ago when the numbers of long lead items were relatively small and

the costs represented a smaller ratio with respect to the costs of the completed weapon system. During the past decade, the procurement environment has changed, but the regulations have not. As has been mentioned elsewhere in this report, lead times on many items have increased dramatically. Increased lead times for more and more items require more advance procurement funding earlier in the procurement program. The alternatives to advance procurement—program extension or production breaks—are unnecessary additional financial burdens on the taxpayers that can and should be avoided.

Termination liability funding

An alternative to fully funding advance procurement requirements is "termination liability" funding. Under this method of contracting for long lead items, the government is obligated to pay the contractor's *actual* expenditures plus termination liability for the advance procurement contract. The government initially pays the initial costs to begin manufacturing of components. When the end items are subsequently purchased, the long lead items are fully funded.

The advantage of termination liability funding is that the amount required to be appropriated and obligated for advance procurement is minimized, while the contractor's manufacturing effort is fully funded at all times. Examples of four programs provided to the panel showed that full funding the advance procurement for those programs would require 163 percent *more* funds to be appropriated for this purpose than if termination liability funding were to be applied. The panel believes that termination liability funding for advance procurement should be adopted as a *policy* since this alternative approach permits a more efficient use of available funds.

The utility of termination liability funding was recognized in the Joint Statement of the Committee of Conference on the Department of Defense Authorization Act, Fiscal Year 1980 (H. Rept. No. 96-546). In that report, the conference committee provided \$130.1 million for advance procurement of long lead items for 72 F/A-18 aircraft and directed the Secretary of Defense to contract for items and services for that purpose on a termination liability basis. The conference committee said:

This method of contracting and budgeting reduces the funding needed prior to the procurement authorization of full funding of the aircraft, and more accurately represents the manufacturing effort actually incurred during the advance procurement period.

Multiyear contracting using single year funds

Dr. William J. Perry, Under Secretary of Defense for Research and Engineering, the General Accounting Office, and the Joint Logistics Commanders have recommended that the Department of Defense be authorized to procure supplies and services by multiyear contracting from funds available only for a single year within the contiguous 48 States. This recommendation was also made by the Commission on Government Procurement which also recommended that such contracts should be based on clearly specified requirements and not exceed a five-year duration unless otherwise authorized by statute.

The panel found that there are statutes that now prohibit the Department of Defense from entering into contracts for needs that extend beyond the current fiscal year when the funds to be used for such contracts are one-year appropriations. The Comptroller General has held that the obligation of funds under such circumstances would violate the Anti-Deficiency Act, the Surplus-Fund-Certified Claims Act of 1949, and the Adequacy of Appropriations Act. The witness representing the Comptroller General expressed the view that single year funds, such as funds for operation and maintenance, cannot be used to finance multiyear contracts for supplies or services inside the 48 contiguous states without specific statutory authorization. The panel notes that Public Law 90-378 (10 U.S.C. 2306(g)) permits the Department of Defense to enter into contracts for supplies and services outside of the contiguous 48 States for which funds would otherwise be available for obligation only within the fiscal year for which the funds are appropriated. Such contracts are subject to the following criteria:

- that there is a continuing requirement for the supplies and services;
- that the furnishing of such supplies or services will require a substantial investment in plant or equipment, or the incurrence of substantial contingent liabilities for the assembly, training, or the transportation of a specified workforce; and,
- that the use of such a contract will promote the best interests of the United States by encouraging effective competition and promoting economies in operation.

The "annual" form of funding is the most prevalent form found within Department of Defense appropriations acts. These funds are available for obligation only for the year in which appropriated unless otherwise specified by law. The Department of Defense must obligate annual funds during the appropriation year for bona fide needs of that year and is precluded from entering into contracts that obligate the government in excess of those needs.

The panel believes that opportunities exist to make substantial savings through multiyear contracting for supplies and services within the 48 contiguous states as well as in overseas areas within the criteria set forth in section 2306 of title 10 of the United States Code. This is especially true in view of the increased use of Office and Management and Budget Circular A-76 that is requiring more and more operation, maintenance, training, and base service functions to be placed under contract. The committee believes that the additional competition that would be engendered through multiyear contracting would result in greater efficiency and considerable savings if applied without geographic limitations.

Criteria for multiyear contracts

The panel emphasizes that multiyear contracting should be effectively managed to the end that property and services, including weapon systems, are acquired in the most timely, economic, and efficient manner. It should be the policy of Congress and the Department of Defense that, except for cost-plus-a-percentage-of-cost contracts, property and services shall be acquired by any kind of contract, including multiyear contracts, that will promote the best interests of the United States. Further, it should be the policy of Congress and the Depart-

ment of Defense that such contracts, where practicable, shall provide for the acquisition of property and services, including weapon systems, at times and in quantities that will result in reduced costs and provide incentives to contractors to improve productivity through investment in capital facilities, equipment, and advanced technology.

The Department of Defense should be authorized to enter into multiyear contract whenever the following conditions exist:

- there will be a continuing requirement for the items to be acquired in quantities consonant with current plans for the proposed contract period, and the risks of contract cancellation are low;
- the furnishing of such property will require a substantial investment in plant or equipment, the incurrence of substantial contingent liabilities, or substantial investment for the assembly, training, or transportation of a specialized work force;
- the use of such a contract will promote the best interests of the United States by encouraging competition, promoting economies in production, and reducing total costs, thereby resulting in a more timely delivery and deployment of the items to be produced and contributing to improved productivity; and
- there is a stable design and the technical risks are not excessive.

It should also be noted that under DAR 15.207.17 neither interest paid by the contractor nor imputed interest on equity working capital is an allowable cost that can be recovered by the contractor. Progress payments are discussed later on in this report in more detail but it should be noted at this point that since interest is not an allowable cost, the incentive for the contractor to take advantage of market conditions in material buys is thereby reduced; therefore, contracting officers should be given more flexibility in making progress payments if full advantage of multiyear contracting is to be taken.

Executive flexibility and congressional control

The panel recognizes the desire of the Executive Branch for maximum flexibility; that is, the ability to reduce or increase budget levels for defense items from year to year, for fiscal or other reasons. The panel also recognizes the desire of the Congress to retain control of the Federal budget through the authorization and appropriations processes. The panel believes that expanded multiyear contracting and the relaxation of full funding regulations do not conflict with those principles.

The panel recognizes that almost all government procurement actions involve some degree of risk to both the government and the contractor. The challenge to defense procurement management is to minimize risks while minimizing expenditures. The challenge to business management is to minimize risks while maximizing profits. The panel believes that management on behalf of both the Department of Defense and defense contractors have placed too much emphasis on risk avoidance and too little emphasis on cost avoidance.

The panel's record shows that there is a need to change some of the ways that the Department of Defense does business and has submitted recommendations for improvements. If these improvements are to work, however, there must be better business management, innovation and fortitude in defense contracting.

TAX AND PROFIT POLICIES NEED REVIEW

FINDING

The panel finds that current tax and profit policies appear to discourage capital investment in new facilities and equipment that would increase productivity and improve the condition of the defense industrial base.

The panel finds that the Executive Branch and the appropriate committees of the Congress should consider

- revision of tax laws to allow more rapid depreciation;
- the amendment or repeal of Cost Accounting Standard 409, "Depreciation of Tangible Capital Assets";
- adjustment of progress payments to reduce contractor borrowing at high interest rates, and payment of interest as an allowable cost in defense contracts;
- amendment of Cost Accounting Standard 414, "Cost of Money as an Element of the Cost of Facilities Capital"; and
- examination of the cost versus benefits of safety, environmental, health, energy, equal employment, and other regulations.

DISCUSSION

According to the Rules of the House of Representatives, the Committee on Armed Services has jurisdiction generally over matters relating to the common defense and also has the oversight responsibility, as do all House committees, of " * * * reviewing and studying on a continuing basis the impact or probable impact of tax policies affecting subjects within its jurisdiction * * *" (clause 2(b)(d), Rule X). The panel has identified possible modifications to the tax system that might improve the defense industrial base. Witnesses from both government and industry who appeared before the committee and the panel identified certain changes that could lead to improved productivity. The panel did not have sufficient time to explore these subjects to the extent the panel believes necessary. Each subject is complicated and warrants a separate review. The panel strongly urges that the appropriate committees of the Congress and the Department of Defense carefully examine each of these possible changes and such other measures that they find would stimulate and encourage capital investment.

Declining productivity

The record of hearings and the several studies completed by the Department of Defense and the General Accounting Office clearly document a decline in the United States' industrial productivity growth rate. According to the November 1979 report of the Comptroller General, *Impediments to Reducing the Costs of Weapons Systems* (PSAD 80-6), the average "annual rate of productivity growth in the past 10

years in the United States has been only one-half of that of the preceding 20 years, and the present rate of productivity improvement is considerably less than that of other industrial nations. The industrial decline of Great Britain has generally been viewed as the world's worst case; however, the United States' manufacturing productivity growth during the period from 1967 to 1977 has shrunk below Great Britain's. *The United States has achieved the alarming distinction of maintaining the lowest average annual manufacturing productivity growth rate among six major industrialized countries.* The range is from Japan's high of 6.8 percent to the United States' low of 2.3 percent, and both West Germany and France have more than doubled our rate." (italics added)

Productivity increases have historically followed capital investments in new plants, equipment, and manufacturing technology. Since such investments are made by management decisions that balance capital investment against long-range profits and the profitability of alternative investments, the United States needs a policy or strategy based upon the relationship between productivity and investment and the impact of tax policies on those two factors. The panel found no evidence of such a policy. The panel found indications that the management and investment practices of industry appear to be more oriented toward short term profit rather than long term growth. Although this is an important issue that needs to be developed, the panel did not specifically address management priorities in detail during its hearings.

While the panel recognized that many considerations are involved in investment decisions, the panel believes that the following issues should be immediately addressed by the Congress and by the Executive Branch.

Depreciation

The panel believes that the current tax system does not encourage industry to invest its profits in modern buildings and equipment. The tax lives of assets are set by the Treasury Department and are intended to reflect the useful life of each asset. Thus, industrial buildings are depreciated over a period of 30 to 45 years and industrial equipment is depreciated over periods of 6 to 12 years. The depreciation system is complex, cumbersome, and is burdened by many rules and regulations. Furthermore, the depreciation of an asset allowable for tax purposes is based on the original *acquisition cost* and not on the *replacement cost*, which, during this era of high inflation rates, is substantially greater. High inflation rates appear to have had a notably negative effect on investment under this current method of depreciation. For example, if the compounded inflation rate is 15 percent, the replacement cost of a piece of equipment quadruples in 10 years. If that equipment is depreciated over 10 years, only 25 percent of the replacement cost is recovered. The very reason for depreciation—replacement of equipment and productive assets—is defeated.

As a hedge against inflation, other industrial countries have adopted various methods of accelerated depreciation for their industries. For example, Switzerland allows a 50 to 80 percent depreciation in the first year for new machinery, 100 percent is allowed in the United

Kingdom in the first year, 95 percent in Japan in the first year, and 100 percent in Canada in the first 2 years. The panel, therefore, was not surprised to learn that the United States is running last in the rate of productivity growth.

The panel was informed that the Department of Defense recently has taken certain initiatives to improve the capability of the industrial base. Mr. Dale Church, Deputy Under Secretary of Defense for Acquisition Policy, stated that the success of the Department's initiatives is not yet known. For example, the Department, earlier this year, attempted to provide incentives to allow a contractor making a capital investment to recover an after-tax return of 15 percent. However, immediately after the Department of Defense instituted the change, the prime interest rate soared to nearly 20 percent, thereby diminishing the intended return.

The panel believes that, as a matter of high priority, the government should consider modification of current depreciation schedules to create an incentive for defense industry to invest in new facilities and equipment.

Cost Accounting Standards Board

The Cost Accounting Standards Board, created by law (50 U.S.C. Appendix 2168) as an agent of the Congress, is responsible for making, promulgating, amending, and rescinding rules and regulations for the implementation of cost accounting standards, that apply to all defense contractors and subcontractors, where procurement contracts exceed a value of \$100,000. The panel received testimony to the effect that the Board is now defunct and that its functions may be transferred to the Office of Federal Procurement Policy within the Office of Management and Budget. The panel was told that currently there is no mechanism for amending or rescinding those cost accounting standards that have been promulgated. The panel received recommendations from several witnesses that two cost accounting standards should be modified—CAS 409 and CAS 414.

Cost Accounting Standard 409

Cost Accounting Standard (CAS) 409, concerning the depreciation of tangible capital assets, states at 409.50(f)(1) that:

The method of depreciation used for financial accounting purposes (or other accounting purposes where depreciation is not recorded for financial accounting purposes) *shall be used for contract costing* unless (i) such method does not reasonably reflect the expected consumption of services for the tangible capital asset (or group of assets) to which applied, or (ii) the method is unacceptable for Federal income tax purposes. (emphasis added)

CAS 409 was incorporated into the Armed Services Procurement Regulation (now Defense Acquisition Regulation (DAR) at 15-205.9 that states, "allowable depreciation shall not exceed the amounts used for book and statement purposes * * *"

The effect of CAS 409 is to require depreciation, used for contract cost purposes, to be based on the historical useful life of capital assets or on their economical useful life. The Department of Defense has

implemented this standard by accepting the depreciation cost used by contractors for financial accounting purposes to their stockholders, which can be at a much slower rate of depreciation than the contractor uses for income tax purposes.

Some of those supporting a change in CAS 409 argue that even if other devices, such as tax incentives, were provided to encourage contractor investment in plants and machinery, CAS 409 would thwart those efforts because contractors would have to depreciate their assets using one method for tax purposes and another method to recover depreciation of those same assets on Department of Defense contracts. Therefore, it is argued, capital recovery programs such as that contained in the Capital Cost Recovery Act of 1979 (H.R. 4646 and S. 1435) being considered by the Congress, would be negated by CAS 409. It was suggested that this cost accounting standard be revised to require that Department of Defense depreciation accounting rules be compatible with tax incentives and with any national investment policy.

Some industry witnesses suggested that CAS 409 should be repealed, particularly because it necessitates recordkeeping to develop the historical basis for the tax lives of the assets.

The Department of Defense position on CAS 409 is that it is in keeping with the concept used in the contractors' financial accounting for capital assets and generally reflects the actual useful lives of the assets. The Department also takes the position that CAS 409 would not negate the potential tax benefits of any accelerated depreciation measure and if CAS 409 were revised to require the use of accelerated depreciation for contract cost purposes, then contractors doing business with the government would receive benefits far exceeding those available to businesses selling to the public market. The defense contractor would, therefore, receive both a tax benefit and an increase in cost chargeable to the government under government contracts. On the commercial market only the tax benefit would be available, because commercial contractors could not increase their prices and remain competitive with foreign suppliers. The Department believes that the repeal of CAS 409 would significantly and, perhaps, prohibitively increase the cost of weapons systems.

While the Department of Defense does not recommend that CAS 409 should be changed to comply with tax laws, the Department does support revision of CAS 409 to permit the use of alternative depreciation methods where their use would increase capital investment and thereby decrease the total cost of the weapon systems.

The panel believes that the organizations responsible for the functions of the Cost Accounting Standards Board and the Department of Defense should review CAS 409 with the objective of creating greater incentive for contractors to invest in capital equipment.

Cost Accounting Standard 414

Cost Accounting Standard 414, entitled, *Cost of Money as an Element of the Cost of Facilities Capital*, became effective on October 1, 1976, and was implemented in DAR 15-205.50.

The purpose of CAS 414 was to give relief to contractors for the cost of money for facilities by establishing criteria for the measurement and allocation of the cost of capital committed to facilities as an ele-

ment of contract cost, and to offset that cost in developing the contract profit objective. Under CAS 414, the capital cost of money for facilities is removed as an unidentified contract profit amount and is treated separately as an identified contract cost. The Cost Accounting Standards Board's intent was, apparently, that a contractor, with substantial investment in facilities, should receive increased compensation. This intent, in part, has been subsequently frustrated since the government has now removed this cost from the contract profit and now determines a rate of return on the cost of capital based on the Treasury rate, which today is substantially less than the actual cost of money to industry.

The Cost Accounting Standards Board selected the Treasury rate for determining the return on imputed capital for equipment because, in its opinion, the rate approximated the real cost of money for long-term investments. The Department of Defense informed the panel that it would support a revision to CAS 414, and suggested that consideration of the use of alternate long-term market money rates would be equally appropriate. The panel believes the use of short-term money rates, however, would be inappropriate for return on investments in capital equipment. The panel urges an examination of CAS 414 in order to provide flexibility such as using alternate rates that reflect a rate of capital cost closer to the actual rate.

Progress payments

Defense Acquisition Regulation (DAR) E-503.1 establishes the uniform standard percentages of progress payments to defense contractors. Progress payments compensate the contractor for labor, materials, and other costs incurred as the work on the contract progresses toward completion. These costs are billed to the contracting officer periodically, after they have been paid by the contractor as established by the contract. Prudent management requires that the government withhold a portion of progress payments as a protection against the contractor's nonperformance of the contract. The usual progress payment is 80 percent of total costs for contractors other than small businesses. For contracts awarded to small businesses, the rate is 85 percent. To the extent that the contractor's costs are not compensated, the contractor is required to carry the cost of working capital.

Dr. Allen Puckett, Chairman and Chief Executive Officer, Hughes Aircraft Co., provided the panel with an insight into the cost to the contractor of working capital not covered by progress payments. He stated: "In fact, the situation is much more complex because of time lags in recording cost, submitting billings, and receiving payment. Data gathered in a recent industry survey indicate that at an 80 percent rate, progress payments actually provide only about 60 percent of the working capital investment and the contractor must provide the balance of 40 percent."

In addition, interest paid by the contractor on his share that is financed by borrowing, or imputed interest on any working capital financed from equity, is not an allowable cost recoverable from the government under the existing regulation (DAR 15.207.17). Therefore, assuming a 15 percent interest rate, as opposed to what is considered a normal interest rate, the cost of the contractor's share of the working capital to the contractor will result in a substantial decrease in realized profits. The panel believes that this decrease in profits directly impacts

industry's cash flow and ability to reinvest in capital equipment and new technology.

If contracting officers were given more flexibility in making progress payments, and were allowed to compute the amount to be paid by the individual contractor and individual contract up to 100 percent of the contractor's cost, the contractor would not have to use large amounts of his own capital. Consequently, the problem caused by high interest rates paid by a contractor would substantially diminish.

The panel realizes that progress payments provide a degree of protection to the government against the failure of a contractor to perform under the contract. However, in view of high inflation and interest rates, current progress payment rates may be placing an inordinate burden on defense industry. Changes in progress payments can be addressed by the Secretary of Defense through changes to regulations and the panel believes appropriate action should be taken. It appears to the panel that the government's interests in the contract could be protected by a formula that would consider the risk of non-performance, interest rates, the cost of capital and contract profitability. While progress payments at the 80 percent rate may provide a higher degree of protection to the government, other aspects may well work against the governments' interest in improving productivity.

Other contractor costs

The defense contractor is bound by procurement regulations and practices which determine both profit rates and contract financing terms. In addition, in the last decade, government regulations in other areas have increased dramatically. The recent requirements of safety, environmental, health, energy, equal employment, and other regulations have diverted large amounts of business capital from investment in new equipment and facilities. The cost of compliance particularly hampers the subcontractor who finds his profits eroded by the number of regulatory burdens the system places on his business.

Deputy Under Secretary Church commented to the panel that one major problem he believes influences the capability of the industrial base is "overburdening the defense contracting system with social, economic, and other types of special legislation. It is at least ten times worse than the second worst system of government contracting in the world."

While the panel is unaware of any previously expressed strong Department of Defense position regarding the ill effects of the above legislation, the panel recommends that, in the future, DOD express to the Congress the Department's position before burdensome legislation is passed. Legislation during the past decade has required huge expenditures from industry in attempting to meet unrealistic guidelines and deadlines. Many of these expenditures have had to be given first priority over plant and equipment improvements. In sum, the government has forced industry to invest its profits in nonproductive improvements. The panel agrees that the number of government regulations should be minimized and that defense contracting should not be used to solve social problems. Further, the panel believes the regulations should be examined to assess the cost of compliance compared to the social benefits derived.

NEED FOR LEADERSHIP IN DEFENSE INDUSTRIAL PLANNING

FINDING

The panel finds that while the condition of the defense industrial base is of vital importance to the national defense and security of the United States, responsibility for the condition of the base is dispersed among the committees of Congress and within the Executive Branch. This diffusion of responsibility has contributed to a lack of effective long range planning for industrial responsiveness. It has also made it extremely difficult to assess the overall effects of executive and congressional action on the defense industrial base.

The panel specifically finds

- no focal point for leadership with respect to the defense industrial base within the Congress; jurisdiction of interstate and foreign commerce, public lands, mining, minerals, procurement laws, defense production, procurement, research and development and taxation is divided among several committees;
- no focal point for leadership within the Executive Branch, where responsibility for the defense industrial base is divided among the Departments of Defense, Commerce, Interior, Treasury, Energy, State, and various other agencies; and
- a need for central leadership and coordination in defense industrial base preparedness (defense industrial base preparedness plannings) at least as great as similar needs in the energy and environmental areas. The lack of concentrated leadership within the Congress and in the Executive Branch has served to mask from public view the acute problems afflicting the defense industrial base.

Discussion

Clause 1(c) of Rule X of the Rules of the House of Representatives assigns a very broad area of legislative jurisdiction to the Committee on Armed Services. Jurisdictional areas involved in the panel's report are: the common defense generally; the Department of Defense, the Departments of the Army, Navy and Air Force generally; research and development in support of the Armed Services; strategic and critical materials necessary for the common defense; and military applications of nuclear energy.

In addition to its specific legislative jurisdiction under clause 2 of rule X, the Committee on Armed Services has the responsibility to assist the House in its analysis, appraisal and evaluation of the application, administration, execution and effectiveness of the laws. Also, the committee is responsible, where conditions or circumstances exist, for recommending necessary changes in the law or the enactment of new laws when required.

The committee is charged with a continuing review of the laws applicable to the Department of Defense and the Departments of the

Army, Navy and Air Force in order to determine whether those laws and defense programs are being implemented in accordance with the intent of Congress.

As mentioned elsewhere in this report, the Committee on Armed Services also has the function of reviewing and studying on a continuing basis the impact or probable impact of tax policies affecting the matters within its jurisdiction.

The panel has approached the complex subject assigned to it with both the letter and spirit of rule X in mind. The panel realizes that several of the problems existing in the industrial base can be alleviated by legislative action within the jurisdiction of the Committee on Armed Services. Recommendations for this action are included in the report. However, the ills that now beset the industrial base pervade not only various segments of the Executive Branch but also the jurisdiction of several other standing committees of the House. In those cases, the panel hopes that this report will serve as a catalyst for additional congressional and administrative action.

The panel believes that the assignment of a strong central responsibility and leadership role within the executive branch—not to study, but to act—will be necessary to prevent a further deterioration in our defense industrial responsiveness. On the other hand, the panel believes that a spirit of urgency and cooperation among the several committees of jurisdiction within the House will be necessary. With anything less, both the Congress and the Executive Branch will be attempting the impossible—the reestablishment of a first-rate military force through a second-rate industrial base.

APPENDIX

WITNESS LIST

List of witnesses appearing before the Full Committee and the Defense Industrial Base Panel on the matter of the preparedness of the defense industrial base.

FULL COMMITTEE HEARINGS

SEPTEMBER 17, 1980

Dr. Eugene Fubini, Chairman, Defense Science Board.
Mr. Robert Fuhrman, Chairman, Defense Science Board Summer Study Task Force on Industrial Responsiveness.
Mr. Harry Gray, Chairman and Chief Executive Officer, United Technologies Corp.

SEPTEMBER 18, 1980

Dr. Allen Puckett, Chairman and Chief Executive Officer, Hughes Aircraft Co.

SEPTEMBER 25, 1980

Mr. T. A. Wilson, Chairman of the Board, The Boeing Co.
Mr. Dale Church, Deputy Under Secretary of Defense for Acquisition Policy, Department of Defense.

PANEL HEARINGS

OCTOBER 21, 1980

Mr. Oliver Boileau, President, General Dynamics Corp.

OCTOBER 22, 1980

Mr. Donald Maag, President, Norris Industry.
Mr. Donald White, Consultant to the President, Norris Industry.
Mr. Frank Taylor, President, Tectron, Inc.
Mr. Samuel Garcia, President, Hydraulic Research.
Mr. James Brannan, President, Waltco Engineering Co.
Mr. Walter Brannan, President (ret.), Waltco Engineering Co.
Ms. Maria Belanger, President, Precision Dip Braze, Inc.
Mr. Dick Valdes, General Manager, Precision Dip Braze, Inc.
Mrs. Helen Sherman, President, Sherman Corp.
Ms. Darlene Sherman, Vice President, Sherman Corp.
Mr. Edward Gowen, Vice President, Huck Manufacturing Co.

OCTOBER 23, 1980

Mr. James Weldon, Vice President and General Manager, Electrodynamics Division, The Bendix Corporation (record not published).

OCTOBER 24, 1980

Mr. Jerry Junkins, Vice President, Texas Instruments, Inc.
Mr. Donald Walker, Manager of the Military Products Department, Texas Instruments, Inc.
Mr. Pat Weber, Vice President, Manager of the Electro-optics Division, Texas Instruments, Inc.

NOVEMBER 12, 1980

Gen. Henry Miley, Jr. (ret.), President, American Defense Preparedness Association.
Maj. Gen. Frank Ragano (ret.), Director, Technical Operations, American Defense Preparedness Association.

NOVEMBER 13, 1980

Gen. Alton Slay, Commander, Air Force Systems Command.
Adm. Alfred Whittle, Chief of Naval Material.

NOVEMBER 14, 1980

Gen. John Guthrie, Commanding General, U.S. Army Materiel Development and Readiness Command.

NOVEMBER 17, 1980

Mr. Walton Sheley, Jr., Acting Director, Procurement and Systems Acquisition Division, General Accounting Office.

NOVEMBER 18, 1980

Gen. Alton Slay, Commander, Air Force Systems Command.
Dr. Jacques Gansler, Vice President, Analytical Science Corp.

NOVEMBER 19, 1980

Gen. Bryce Poe II, Commander, Air Force Logistics Command.
Mr. Thomas Bahan, TR-1 Program Manager, Air Force Logistics Command.
Mr. Peter McCloskey, President, Electronic Industries Association (EIA).
Mr. Robert Manship, Chairman, EIA Multiyear Procurement Task Force.
Mr. Jim Drake, Staff Member, 1980 Defense Science Board, Summer Study Task Force on Industrial Responsiveness.
Mr. Wallace Brown, Director, Office of Industrial Mobilization, International Trade Administration, Department of Commerce.
Mr. Iain Baird, Director, Priorities and Allocations Division of the Office of Industrial Mobilization, Department of Commerce.

NOVEMBER 20, 1980

The Honorable Jim Santini, Chairman, Subcommittee on Mines and Mining, Committee on Interior and Insular Affairs, U.S. House of Representatives.
Mr. Paul Krueger, Assistant Associate Director for Research Preparedness, Federal Emergency Management Agency.

DECEMBER 3, 1980

The Honorable William Perry, Under Secretary of Defense for Research and Engineering.
Mr. Robert Trimble, Director, Contract and Systems Acquisition, Department of Defense.